HealthInformaticsInitiative
TRANSFORMING VA HEALTH CARE DELIVERY

Virtual Patient Record (VPR) 1.0

Technical Manual

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Version 1.2

Department of Veterans Affairs

Health Systems Design and Development

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Revision History

Date	Patch or Version	Page	Description	Project Manager	Author
9/11/2013-10/11/2013	VPR*1.0*2	All	Updated title-page fonts to meet end-user documentation standards; updated revision date; updated footer to include package name (re end-user documentation standards); addressed reviewer suggestions and comments; added an installation and a software-availability section to provide information about how to retrieve software and documentation (re end-user documentation standards); added a legal-disclaimers section (re end-user documentation standards); corrected errors in the routines section; updated checksums	Deb Migliore	Cheryl Walton
7/24/2013	VPR*1.0*2	All	Updated title to reflect new patch Updated Overview to add JSON information; added a new (Formatted Data) section to discuss data formatting; added patch information for VPR*1.0*2; added JSON remote procedure call information; added JSON routines; corrected capitalization in routines table; added a JSON example placeholder; added JSON checksums; updated the glossary section	Deb Migliore	Cheryl Walton
7/30/2012	VPR*1.0*1	27	Updated checksum for VPRDPSOR	Deb Migliore	Ruth Markham
6/13/2012	VPR*1.0*1	5-7 11	Updated Clinical Procedures ICRs in Relationships, renumbered the table, increased row height when necessary; changed revised date; fixed typo	Deb Migliore	Ruth Markham
5/18/2012	VPR*1.0*1	2	Added a paragraph about the VPR proxy	Deb Migliore	Ruth Markham

Date	Patch or Version	Page	Description	Project Manager	Author
5/15/12	VPR*1.0*1	All	Changed header colors from blue to black; Corrected formatting issues; Added hyperlinks to revision history; Updated Overview to reflect changes with NwHIN; Added new extract routines for Clinical Observations, Clinical Procedures, Insurance, Exams, Skin Tests, Patient Education; Renamed Pharmacy extract Medications; Renamed Pharmacy Inpatient extract to Inpatient Meds; Renamed Pharmacy Outpatient extract Outpatient Meds; Added Non-VA Meds and IV Fluids/Infusions extracts; Added section for Implementation & Maintenance; Added section for patch description; Modified list of new routines; Updated Routines List with new and modified extract routines; Added section for Security Keys; Updated External relationships table; Added section for Files; Updated Routine List table with new/changed routines and reordered elements alphabetically; Removed elements predecessor, successor, code from VPRDPL routine because they were never populated;	Deb Migliore	Ruth Markham
			Added elements acknowledgement [m], provider, and service to VPRDOR routine; Added element category to VPRDPXHF; Added element encounter to VPRDXIM routine; Added elements clinicStop, provider and type to VPRDSDAM routine (clinicStop was inadvertently missed in the previous version of this TM); Added elements category, images and parent to VPRDTIU routine; Updated Checksums table; Added section Options section; Added a Glossary section;		
08/08/11	VPR*1*0		VPR version 1.0 Release	Deb Migliore	Ruth Markham

Contents

Legal Disclaimers

Reference Materials

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Overview

This document provides technical information for Virtual Patient Record (VPR) version 1.0.

VPR 1.0 is a foundation software package component of the Health Management Platform (HMP) architecture, which is part of the Health Informatics Initiative's (hi^2's) scope.

VPR extracts patient data from domains at local and remote Veterans Health Information Systems and Technology Architecture (VistA) sites to provide a cached view of patient charts. It provides normalized fields with common field names and data structures across domains. VPR includes four remote procedure calls (RPCs): one encompassing routines that extract data from VistA in Extensible Markup Language (XML) format, one encompassing routines that extract VistA data in JavaScript Object Notation (JSON) format, one encompassing routines that calculate checksums for returned data, and one that returns the current VPR version number.

The VPR RPC for XML-formatted data extraction was initially installed in the Nationwide Health Information Network (NwHIN) namespace, which was called NHIN. The NwHIN client used most of the VPR's extract routines in production to get and share data.

After this initial installation, VPR RPCs were installed in the VPR's own (VPR) namespace and renumbered as VPR version 1.0. NwHIN could continue to use the extract routines in its NHIN namespace, but would need to access VPR 1.0, or subsequent versions, to take advantage of future extract routine enhancements.

Note: After the VPR package installed its RPCs in its own (VPR) namespace with VPR 1.0, NwHIN began to use VPR 1.0 to take advantage of future extract-routine enhancements.

Formatted Data

VPR provides XML- and JSON-formatted data to support web applications that transmit data between themselves, servers, and users' browsers.

As its name suggests, XML uses markup to structure and serialize data. This human- and machine-readable format enjoys widespread use as a means of exchanging both text-based documents and structured data. The "XML Example" section of this document contains a snippet of XML-formatted data.

JSON is also a human- and machine-readable data-interchange format; however, its creator focused on making it a vehicle for transmiting structured data, rather than narrative documents. Although it uses several JavaScript notation rules to represent structured data, JSON is programming-language agnostic: JSON parser libraries are available for programming languages that range from ActionScript to Visual Basic. (You can find a comprehensive list of available parser libraries on the JSON.org website.)

JSON supports four primitave and two structured data types:

- Primitave data types:
    - Text strings (quotation-mark delimiters)
    - Numbers
    - Booleans
    - Null
- Structured data types:
    - Objects
    - Arrays

These data types provide a fluid (free-form) way to serialize data transmissions. For example, developers can represent objects that encompass arrays and arrays that encompass objects. They can also include non-significant white space around JSON's structural elements (curly and block brackets, colons, and commas) to enhance human readability. The "JSON Example" section of this document contains a snippet of JSON-formatted data.

Like XML, JSON supports asynchronous JavaScript and XML (Ajax), which allows web applications to send and receive data to and from web pages. As a result, both formats are viable options for data interchanges involving web applications. Two notable cases in point are HMP, which uses JSON-formatted data, and NwHIN, which uses XML-formatted data.

Implementation and Maintenance

Software Availability

You can download the latest versions of VPR software and documentation, including this manual, via File Transfer Protocol (FTP) from ftp://download.vista.med.va.gov/. This site transmits files from the first available server. You can also download files directly from the following FTP servers:

- Albany ftp.fo-albany.med.va.gov <ftp://ftp.fo-albany.med.va.gov>
- Hines ftp.fo-hines.med.va.gov <ftp://ftp.fo-hines.med.va.gov>
- Salt Lake City ftp.fo-slc.med.va.gov <ftp://ftp.fo-slc.med.va.gov>

Installation

Instructions for installing the package are available in the *Virtual Patient Record (VPR) 1.0 Installation Guide*, which you can download from the FTP sites listed in the preceding section or from the VA Software Document Library at http://www.va.gov/vdl/application.asp?appid=197. You can download instructions for installing patches to VPR from the FTP sites listed in the preceding section. You can also download the most recent version of this technical manual from the VA Software Document Library.

Patch VPR*1.0*1

This patch corrects two reported issues with VPR 1.0 and makes additional data domains available:

- Clinical Observations (CLiO)
- Clinical Procedures
- Inpatient Medications (complex orders)
- Insurance (from Integrated Billing)
- PCE Exams, Patient Education, and Skin Tests
- Women's Health Pregnancy Log, returned as a condition with the Problem List if the patient is currently pregnant

Seven routines in this patch are new; this is their first release:

VPRDIB ..... Insurance Policies extract

VPRDMC ..... Procedures (Medicine/Cardiology) extract

VPRDMDC ..... Observations (CLiO) extract

VPRDPSOR ..... Medications, by order extract

VPRDPXAM ..... Exams extract

VPRDPXED..... Education Topics extract

VPRDPXSK..... Skin Tests extract

Important: Do not terminate the VPR Application Proxy from file 200. It must remain active for NwHIN to work. Please check your entry to make sure it looks similar to the following listing:

NAME: VPR,APPLICATION PROXY DATE ENTERED: SEP 08, 2011

SECONDARY MENU OPTIONS: VPR APPLICATION PROXY

User Class: APPLICATION PROX ISPRIMARY: Yes

PROVIDER KEY (c): 0

Patch VPR*1.0*2

Patch VPR*1.0*2 adds two new RPCs, VPR GET PATIENT DATA JSON and VPR GET CHECKSUM, to the VPR package. VPR GET PATIENT DATA JSON enables JSON-formatted patient health data extracts from VistA databases. Web applications such as HMP can then use the JSON-formatted data. VPR GET CHECKSUM retrieves requested data from VistA and returns it as checksums, enabling devices and applications to check data for transmission errors. This RPC uses a new routine (VPRDCRC), which returns a cyclic redundancy check 32-bit polynomial (CRC32) checksum value.

The patch also adds a new option, [VPR TEST JSON] View JSON results, that enables designated testers to view the data VPR 1.0 returns so they can verify its accuracy by comparing it with data from Computerized Patient Record System (CPRS) or VistA. This option has no special restrictions.

The following new (previously unreleased) routines support the VPR GET PATIENT DATA JSON and VPR GET CHECKSUM RPCs:

VPRDCRC ..... CRC32 for VistA compute

VPRDJ ..... VistA data server

VPRDJ0 ..... Vista data server (cont)

VPRDJ00 ..... Patient demographics extract

VPRDJ01 ..... Orders extract

VPRDJ02 ..... Problems, allergies, vitals extract

VPRDJ03 ..... Consults, clinical procedures, CLiO extract

VPRDJ04 ..... Appointments and visits extract

VPRDJ04A ..... Admissions and PTF extract

VPRDJ05 ..... Medications extract

VPRDJ05V ..... IV fluids and infusions extract

VPRDJ06 ..... Laboratory extract

VPRDJ07 ..... Radiology,surgery extract

VPRDJ08 ..... Documents extract

VPRDJ08A ..... Documents extract (cont)

VPRDJ09 ..... PCE extract

VPRDJT ..... JSON VistA data RPC test

VPRJSON ..... Decode and encode JSON

VPRJSOND ..... Decode JSON

VPRJSONE ..... Encode JSON

VPRP2I ..... Post initialization

VPRUTILS ..... VPR utilities routine

VPR GET PATIENT DATA JSON and its accompanying routines pull data from VistA in the same way the previously released RPC and its routines pull VistA data. However, it returns this data using JSON—as opposed to XML—formatting.

Finally, VPR*1.0*2 includes the following previously released routines:

VPRD ..... Patient datat extract broker

VPRDGMPL ..... Problems extract

VPRDLR ..... XML labs extract

VPRDLRA ..... Labs-by-accession extract

VPRDLRO ..... XML lab panel extract

VPRDMC ..... Clinical procedures extract

VPRDPXIM ..... XML immunization extract

VPRDTIU ..... Documents extract

VPRDVSIT ..... Visits and encounters extract

Remote Procedure Calls

Remote Procedure Call	M Entry Point
VPR GET CHECKSUM	CHECK^VPRDCRC
VPR GET PATIENT DATA	GET^VPRD
VPR GET PATIENT DATA JSON	GET^VPRDJ
VPR DATA VERSION	VERSION^VPRD

The VPR GET CHECKSUM RPC retrieves data from VistA and calls routine VPRDCRC to perform CRC32 calculations. VPRDCRC then returns the calculations as checksum values.

The VPR DATA VERSION RPC gets the value of the current VPR version and returns it as a string. Any application with the appropriate Integration Control References (ICRs—formerly called Database Integration Agreements, or DBIAs) can use this RPC to extract the version from VPR software.

The VPR GET PATIENT DATA RPC retrieves data from VistA and returns it as XML in a ^TMP global. Applications with the appropriate ICRs can use this RPC to extract data from VistA.

Developers can specify input parameters to determine the types and amounts of data the RPC will extract from VistA:

- Internal entry number (IEN) from PATIENT file (#2) (optionally data file number [DFN] or integration control number [ICN] for remote calls) [required]
- The kinds of data to extract, which may include:
  - Allergies and reactions
  - Appointments
  - Consults
  - Demographics
  - Documents
  - Education topics
  - Exams
  - Flags (Patient Record Flags)
  - Health Factors
  - Immunizations
  - Insurance policies
  - Labs
  - Labs by accession
  - Labs by order or panel
  - Medications
  - Medications by order

- Observations (CLiO)
- Orders
- Problems
- Procedures
- Procedures (medicine and cardiology)
- Radiology exams
- Skin tests
- Surgical procedures
- Visits and encounters
- Vitals

- The date and time from which to begin searching for data [optional]
- The date and time at which to end searching for data [optional]
- The maximum number of items to return per data type [optional]
- The identifier of a single item to return [optional, but TYPE must also be defined when used]
- List of name-value pairs, further refining the search

The output from this RPC is a text array formatted as XML in the temporary global ^TMP("VPR",$J,n).

The VPR GET PATIENT DATA JSON RPC retrieves data from VistA, and returns it as JSON-formatted documents in a ^TMP global. Applications with appropriate ICRs can use this RPC to extract data from VistA.

Application developers can specify input parameters to determine the types and amounts of data the RPC will extract from VistA by entering the parameters as a list of name-value pairs. Some of the most commonly used parameters include:

- IEN from PATIENT file (#2) (optionally DFN;ICN for remote calls) [required]
- The kinds of data to extract, which may include:
  - Allergies and reactions
  - Appointments
  - Clinical procedures
  - Consults
  - Demographics
  - Documents
  - Education topics
  - Exams
  - Health Factors
  - Immunizations
  - Lab results
  - Medications
  - Observations (CLiO)

  - Orders
  - Problems
  - Purpose of visit (POV)
  - Radiology exams
  - Skin tests
  - Surgical procedures
  - Visits and admissions
  - Vitals
- The date and time from which to begin searching for data [optional]
- The date and time at which to stop searching for data [optional].
- The maximum number of items to return per data type [optional]
- The identifier of a single item to return [optional, but TYPE must also be defined when used]
- Additional name-value pairs, further refining the search [optional]

The RPC's output is a text array formatted as JSON in the temporary global ^TMP("VPR",$J,n).

Security Keys

The VPR RPC package contains no security keys.

External Relationships

The following table contains information about which ICRs cover usage of which routines and global references.

#	ICR (DBIA)	Global Reference	Package
1	^AUPNPROB	5703	Problem List
2	^AUPNVSIT	2028	PCE Patient Care Encounter
3	^AUTTHF	4295	PCE Patient Care Encounter
4	^DGPM	1865	Registration
5	^DGS(41.1)	3796	Registration
6	^DGSL(38.1)	767	Registration
7	^DIC(31)	733	HINQ
8	^DIC(40.7)	557	Scheduling
9	^DIC(42)	723	Registration
10	^DPT	5708	Registration
11	^DPT	5597	Registration
12	^LAB(61)	524	Laboratory
13	^LR	525	Laboratory
14	^LRO(68)	1963	Laboratory
15	^LRO(69)	2407	Laboratory
16	^MDC(704.101*)	5748	Clinical Procedures
17	^MDC(704.102*)	5809	Clinical Procedures
18	^MDC(704.1122)	5999	Clinical Procedures
19	^MDC(704.116)	5995	Clinical Procedures
20	^MDC(704.1161)	5996	Clinical Procedures
21	^MDC(704.117*)	5810	Clinical Procedures
22	^MDC(704.118*)	5811	Clinical Procedures
23	^OR(100)	5771	Order Entry/Results Reporting
24	^ORA(102.4)	5679	Care Management
25	^ORD(100.98)	873	Order Entry/Results Reporting
26	^ORD(101.43)	2843	Order Entry/Results Reporting

#	ICR (DBIA)	Global Reference	Package
27	^PSB(53.79)	5909	Bar Code Med Admin (BCMA)
28	^PXRMINDX	4290	PCE Patient Care Encounter
29	^RADPT	2480	Radiology/Nuclear Medicine
30	^RARPT	5605	Radiology/Nuclear Medicine
31	^SRF(130)	5675	Surgery
32	^SRO(136)	4872	Surgery
33	^TIU(8925.1)	5677	Text Integration Utilities
34	^TIU(8925.1)	2321	Text Integration Utilities
35	^TIU(8926.1)	5678	Text Integration Utilities
36	^WV(790.05)	5772	Women's Health
37	DGPFAPI	3860	Registration
38	GMPLUTL2	2741	Problem List
39	GMRCGUIB	2980	Consult Request Tracking
40	GMRCSLM1	2740	Consult Request Tracking
41	GMRVUT0	1446	Gen. Med. Rec. - Vitals
42	GMVRPCM	5702	Gen. Med. Rec. - Vitals
43	LR7OR1	2503	Laboratory
44	LR7OU1	2955	Laboratory
45	LRPXAPI	4245	Laboratory
46	MDPS1	4230	Clinical Procedures
47	ORCD	5493	Order Entry/Results Reporting
48	ORQ1	3154	Order Entry/Results Reporting
49	ORQ12	5704	Order Entry/Results Reporting
50	ORX8 [$$OI, $$VALUE]	2467	Order Entry/Results Reporting
51	ORX8 [$$PKGID]	3071	Order Entry/Results Reporting
52	ORX8 [EN]	871	Order Entry/Results Reporting
53	PSOORRL	2400	Outpatient Pharmacy
54	PXAPI	1894	PCE Patient Care Encounter

#	ICR (DBIA)	Global Reference	Package
55	PXPXRM	4250	PCE Patient Care Encounter
56	SROESTV	3533	Surgery
57	TIUCNSLT	5546	Text Integration Utilities
58	TIUCP	3568	Text Integration Utilities
59	TIULQ	2693	Text Integration Utilities
60	TIULX	3058	Text Integration Utilities
61	TIUSROI	5676	Text Integration Utilities
62	TIUSRVLO	2834	Text Integration Utilities
63	TIUSRVLO	2865	Text Integration Utilities
64	TIUSRVR1	2944	Text Integration Utilities
65	VADPT2	325	Registration
66	XUSAP	4677	Kernel

Files

No files are released with VPR at this time.

Parameters

Parameter List

VPR RPCs include the following parameters:

VPR Parameter	Description
VPR OBS VIEW TYPE	This parameter names, or names types of, CLiO observation collections that reside in the supplemental pages of flowsheets and group multiple, related observations. The CLiO groupings have no names or descriptions that other applications can display. By naming (or typing) these collections, VPR OBS VIEW TYPE enables applications that are interested in specific groups—such as groups that identify an instance of catheter care (Foley, IV, or drain)—to display the information they contain.
VPR SYSTEM NAME	This parameter holds the local VistA system's name as a hashed hexidecimal (base 16) value. A VPR patch post-initialization routine calculates this value and places it into the system-level value; it should not be modified.
VPR VERSION	This parameter holds the current version number of the VPR's data-extract RPCs in the following form: V.PP, where *V* is the package version number—1.0, for example, and *PP* is the latest patch number.

Routines

Routine List

VPR RPCs include the following routines:

#	Routine	Description
1	VPRD	VPR GET PATIENT DATA RPC: responds to requests for data and serves as a broker, calling the appropriate VPR data extract routines to gather requested data VPR DATA VERSION RPC: returns a string identifying the current version of the VPR data extracts
2	VPRDCRC	CRC32 computation for VistA data: accepts input from VPR GET CHECKSUM and returns it as a parameter containing CRC32 checksum values

#	Routine	Description
3	VPRDGMPL	Problems extract: responds to requests for problem list and pregnancy data and returns XML-formatted results for the following attributes: • acuity • comment [m] • entered • exposure [m] • facility • history • icd • id • location • name • onset • problemType • provider • removed • resolved • sc • service • status • unverified • updated
4	VPRDGMRA	Allergy-reaction extract: responds to requests for allergy and reaction data and returns XML-formatted results for the following attributes: • comment [m] • drugClass [m] • drugIngredient [m] • entered • facility • id • localCode • mechanism • name • reaction [m] • removed • severity • source • type • verified • vuid

#	Routine	Description
5	VPRDGMRC	Consults extract: responds to requests for consultation data and returns XML-formatted results for the following attributes: • document [m] • facility • id • name • orderID • procedure • requested • result • service • status • type
6	VPRDGMV	Vitals extract: responds to requests for data regarding vital-sign measurement and returns XML-formatted results for the following attributes: • entered • facility • location • measurement [m] o id o vuid o name o value o units o metricValue o metricUnits o high o low o qualifier [m] • removed [m] • taken

#	Routine	Description
7	VPRDGPF	Flags extract: responds to requests for Patient Record Flag data and returns XML-formatted results for the following attributes (only returns flags that are currently active): • approvedBy • assigned • category • content • document • id • name • origSite • ownSite • reviewDue • type

8	VPRDIB	Insurance policies extract: responds to requests for insurance data and returns XML-formatted results for the following attributes (returns only policies that are currently active):
		• company
		  o id
		  o name
		  o address
		  o telecom
		• effectiveDate
		• expirationDate
		• groupName
		• groupNumber
		• id
		• insuranceType
		• relationship
		• subscriber

9	VPRDJ	VistA data as JSON via RPC server: responds to requests for data through VPR GET PATIENT DATA JSON and serves as a broker, calling appropriate VPR data extract routines to gather requested data
10	VPRDJ0	VistA data as JSON via RPC server (cont): serves data as JSON-formatted content for VPR GET PATIENT DATA JSON RPC
11	VPRDJ00	Patient demographics extract: responds to requests for patient demographics data and returns results in JSON format

#	Routine	Description
12	VPRDJ01	Orders extract: responds to requests for order data and returns results in JSON format for the following attributes: • acknowledgement [m] • adminTimes • clinicians [m] • content • displayGroup • entered • facilityCode • facilityName • localId • locationName • locationUid • name • oiCode • oiName • oiPackageRef • predecessor • providerName • providerUid • results [m] • scheduleName • service • start • statusCode • statusName • statusVuid • stop • successor • uid

#	Routine	Description
13	VPRDJ02	Problems, allergies, and vitals extract: responds to requests for problems, allergies, and vitals data and returns results in JSON format for the following attributes: • acuityCode (problems) • acuityName (problems) • assessments (allergies) • comments [m] (problems) • displayName (vitals) • entered (allergies, problems) • facilityCode (allergies, problems, vitals) • facilityName (allergies, problems, vitals) • high (vitals) • historical (allergies) • icdCode (problems) • icdName (problems) • kind (allergies, vitals) • localId (allergies, problems, vitals) • locationName (problems, vitals) • locationUid (problems, vitals) • low (vitals) • metricResult (vitals) • metricUnits (vitals) • observed (vitals) • onset (problems) • problemText (problems) • products [m] (allergies) • providerName (problems) • providerUid (problems) • reactions [m] (allergies) • reference (allergies) • removed (problems) • resolved (problems) • result (vitals) • resulted (vitals) • serviceConnected (problems) • statusCode (problems) • statusName (problems) • summary (allergies, vitals) • typeCode (vitals) • typeName (vitals) • uid (allergies, problems, vitals) • units (vitals) • unverified (problems) • updated (problems) • verified (allergies)

#	Routine	Description
14	VPRDJ03	Consults, clinical procedures, and CLiO extract: responds to requests for consultation, clinical procedure, and CLiO data and returns results in JSON format for the following attributes: • bodySiteCode (CLiO) • bodySiteName (CLiO) • category (clinical procedures, consults) • comment (CLiO) • consultProcedure (consults) • consultUid (clinical procedures) • dateTime (clinical procedures, consults) • encounterUid (clinical procedures) • entered (CLiO) • facilityCode (clinical procedures, CLiO, consults) • facilityName (clinical procedures, CLiO, consults) • hasImages (clinical procedures) • interpretation (clinical procedures, consults) • interpretationCode (CLiO) • interpretationName (CLiO) • kind (clinicalprocedures) • localId (CLiO, clinical procedures, consults) • locationName (CLiO) • locationUid (CLiO) • methodCode (CLiO) • methodName (CLiO) • name (clinical procedures) • observed (CLiO) • orderName (consults) • orderUid (clinical procedures, consults) • providerName (consults) • providers [m] (clinical procedures) • providerUid (consults) • qualifiers [m] (CLiO) • requested (clinical procedures) • result (CLiO) • results [m] (clinical procedures, consults) • service (consults) • setID (CLiO) • setName (CLiO) • setStart (CLiO) • setStop (CLiO) • setType (CLiO) • statusCode (CLiO) • statusName (clinical procedures, CLiO, consults) • typeCode (CLiO) • typeName (CLiO, consults) • uid (CLiO, clinical procedures, consults) • units (CLiO)

#	Routine	Description
15	VPRDJ04	Appointments and visits extract: responds to requests for data regarding patient appointments and visits and returns results in JSON format for the following attributes: • appointmentStatus • categoryCode • categoryName • checkIn • checkOut • dateTime • documents [m] • facilityCode • facilityName • localId • locationName • locationUid • movements [m] • patientClassCode • providers [m] • reasonName • reasonUid • roomBed • service • specialty • stopCodeName • stopCodeUid • summary • typeName • uid
16	VPRDJ04A	Admissions and PTF file (#45) (Patient Treatment File) extract: responds to requests for data regarding patient admissions and treatments and returns results in JSON format for the following attributes: • arrivalDateTime • dischargeDateTime • encounterName • encounterUid • facilityCode • facilityName • icdCode • icdName • localId • principalDx • uid

#	Routine	Description
17	VPRDJ05	Medications extract: responds to requests for data about medications and returns JSON-formatted results for attributes corresponding to the types of medications: • administrations [m] • comment • dosages [m] • facilityCode • facilityName • fills [m] • IMO • localId • medStatus • medStatusName • name • orders [m] • overallStart • overallStop • patientInstruction • productFormName • products [m] • qualifiedName • sig • stopped • supply • type • uid • vaStatus

#	Routine	Description
18	VPRDJ05V	IV fluids and infusions extract: responds to requests for IV fluids and infusions data and returns results in JSON format for attributes corresponding to the types of medications: • administrations [m] • comment • dosages [m] • facilityCode • facilityName • fills [m] • IMO • localId • medStatus • medStatusName • name • orders [m] • overallStart • overallStop • patientInstruction • productFormName • products [m] • qualifiedName • sig • stopped • supply • type • uid • vaStatus

#	Routine	Description
19	VPRDJ06	Laboratory extract: responds to requests for chemistry results and returns data in JSON format for the following attributes: • categoryCode • categoryName • comment • displayName • facilityCode • facilityName • gramStain [m] • groupUid • high • interpretationCode • interpretationName • labOrderId • localId • low • observed • orderUid • organisms [m] • resulted • results • sample • specimen • statusCode • statusName • typeCode • typeId • typeName • uid • units • urineScreen

#	Routine	Description
20	VPRDJ07	Radiology and surgery extract: responds to requests for radiology and surgery data and returns results in JSON format for the following attributes: • case (radiology) • category (surgery) • cpt (surgery) • dateTime (radiology, surgery) • diagnosis [m] (radiology) • encounterName (radiology, surgery) • encounterUid (radiology, surgery) • facilityCode (radiology, surgery) • facilityName (radiology, surgery) • hasImages (radiology) • imageLocation (radiology) • imagingTypeUid (radiology) • interpretation (radiology) • kind (radiology, surgery) • localId (radiology, surgery) • locationName (radiology) • locationUid (radiology) • name (radiology) • orderName (radiology) • orderUid (radiology) • providers [m] (radiology, surgery) • results [m] (radiology, surgery) • statusName (radiology, surgery) • summary (radiology, surgery) • typeCode (surgery) • typeName (radiology, surgery) • uid (radiology, surgery) • verified (radiology)

#	Routine	Description
21	VPRDJ08	Documents extract: responds to requests for information regarding documents and returns results in JSON format for the following attributes (Text Integration Utility [TIU] domain): • attendingName • attendingUid • documentClass • documentTypeCode • documentTypeName • encounterName • encounterUid • entered • facilityCode • facilityName • images • localId • localTitle • nationalTitle* • parent • referenceDateTime • statusName • subject • text [m] • uid • urgency
22	VPRDJ08A	Documents extract (cont): responds to requests for information regarding documents and returns results in JSON format (see VPRDJ08 for a list of TIU attributes)

#	Routine	Description
23	VPRDJ09	PCE extract: responds to requests for data from the PCE package and returns results in JSON format for the following attributes: • administeredDateTime • category • comment • contraindicated • cptCode • cptName • encounterName • encounterUid • entered • facilityCode • facilityName • icdCode • kind • localId • locationName • name • performerName • performerUid • quantity • reactionCode • reactionName • result • seriesCode • seriesName • severity • summary • uid
24	VPRDJT	JSON VistA data test: returns VistA data to the screen from the JSON RPC based on user-entered selection criteria

#	Routine	Description
25	VPRDLR	Labs extract: responds to requests for chemistry results and returns XML-formatted results for the following attributes: • collected • comment • facility • groupName • high • id • interpretation • labOrderID • localName • loinc • low • orderID • result • resulted • sample • specimen • status • test • type • units • vuid

#	Routine	Description

26	VPRDLRA	Labs-by-accession extract: responds to requests for lab results grouped by accession and returns XML-formatted results for the following attributes:
		• collected
		• comment
		• document
		• facility
		• groupName
		• id
		• labOrderID
		• name
		• resulted
		• sample
		• specimen
		• status
		• type
		• value
		  o high
		  o id
		  o interpretation
		  o localName
		  o loinc
		  o low
		  o result
		  o test
		  o units
		  o vuid

#	Routine	Description

27	VPRDLRO	Lab panel extract: responds to requests for lab results grouped by order or panel and returns XML-formatted results for the following attributes:
		• collected
		• comment
		• facility
		• groupName
		• id
		• order
		• resulted
		• sample
		• specimen
		• status
		• type
		• value
		  o high
		  o id
		  o interpretation
		  o loinc
		  o low
		  o result
		  o test
		  o units
		  o vuid

28	VPRDMC	Clinical-procedure extract: responds to requests for medicine and cardiology procedure data, directly or via the Procedures extract, and returns XML-formatted results for the following attributes: • category • consult • dateTime • document [m] • encounter • facility • hasImages • id • interpretation • location • name • order • provider • requested • status • type

#	Routine	Description
29	VPRDMDC	Observations (CLiO) extract: responds to requests for clinical observation data and returns XML-formatted results for the following attributes (returns only verified observations): • bodySite • comment • entered • facility • id • location • method • name • observed • position • product • quality • range • status • units • value • vuid
30	VPRDOR	Orders extract: responds to requests for order data and returns XML-formatted results for the following attributes: • acknowledgement [m] • content • entered • facility • group • id • location • name • provider • service • start • status • stop
31	VPRDPROC	Procedures extract: responds to requests for procedure data in a domain that combines Surgery, Radiology, and Clinical Procedures packages; please refer to VPRDSR, VPRDRA, and VPRDMC in this table for attribute information
32	VPRDPS	Medications extract: responds to requests for data regarding medications and returns XML-formatted results for attributes based on the type of medication (see the next four table entries for attribute details)

#	Routine	Description

33	VPRDPS: Inpatient (unit dose) medications	Medications extract for inpatient (unit dose) medications: returns XML-formatted results for the following attributes:
		• currentProvider
		• dose [m]
		  o conjunction
		  o dose
		  o doseStart
		  o doseStop
		  o duration
		  o noun
		  o order
		  o route
		  o schedule
		  o units
		  o unitsPerDose
		• facility
		• form
		• id
		• IMO
		• location
		• medID
		• name
		• ordered
		• orderID
		• orderingProvider
		• parent
		• pharmacist
		• product [m]
		  o class
		  o code
		  o concentration
		  o name
		  o order
		  o role
		  o vaGeneric
		  o vaProduct
		• sig
		• start
		• status
		• stop
		• vaStatus
		• vaType

#	Routine	Description

34	VPRDPS: IV fluids and infusions	Medications extract for fluids and infusions: responds to requests for intravenous fluids and infusions data and returns XML-formatted results for the following attributes:
		• currentProvider
		• dose [m]
		• facility
		• id
		• ivLimit
		• location
		• medID
		• name
		• ordered
		• orderID
		• orderingProvider
		• pharmacist
		• product
		  o class
		  o code
		  o concentration
		  o name
		  o ordItem
		  o role
		  o vaGeneric
		  o vaProduct
		• rate
		• start
		• status
		• stop
		• vaStatus
		• vaType

#	Routine	Description

35	VPRDPS: Non-VA medications	Medications extract for non-VA medications: returns XML-formatted results for the following attributes:
		• currentProvider
		• dose [m]
		  o noun
		  o route
		  o schedule
		  o units
		  o unitsPerDose
		• facility
		• form
		• id
		• location
		• medID
		• name
		• ordered
		• orderID
		• orderingProvider
		• product [m]
		  o class
		  o code
		  o concentration
		  o name
		  o role
		  o vaGeneric
		  o vaProduct
		• sig
		• start
		• status
		• stop
		• type
		• vaStatus
		• vaType

#	Routine	Description

36	VPRDPS: Outpatient medications	Medications extract for outpatient medications: returns XML-formatted results for the following attributes:
		• currentProvider
		• daysSupply
		• dose [m]
		  o conjunction
		  o dose
		  o doseStart
		  o doseStop
		  o duration
		  o noun
		  o route
		  o schedule
		  o units
		  o unitsPerDose
		• expires
		• facility
		• fill [m]
		• fillCost
		• fillsAllowed
		• fillsRemaining
		• form
		• id
		• lastFilled
		• location
		• medID
		• name
		• ordered
		• orderID
		• orderingProvider
		• pharmacist
		• prescription
		• product [m]
		  o class
		  o code
		  o concentration
		  o name
		  o role
		  o vaGeneric
		  o vaProduct
		• ptInstructions
		• quantity
		• routing
		• sig
		• start
		• status
		• stop
		• supply
		• type
		• vaStatus
		• vaType

#	Routine	Description
37	VPRDPSOR	Medications-by-order extract: responds to requests for medication-by-order data and returns XML-formatted results for attributes corresponding to the type of medication; returns data in the same four formats as VPRDPS, except may return inpatient medications with multiple doses instead of one dose per medication; see previous entry for VPRDPS for details
38	VPRDPT	Demographics extract: responds to requests for patient-demographic data and returns XML-formatted results for the following attributes: • address • alias [m] • bid • died • disability [m] • dob • ethnicity [m] • exposure [m] • facility [m] • familyName • flag [m] • fullName • gender • givenNames • icn • id • lrdfn • maritalStatus • race [m] • religion • sc • scPercent • sensitive • ssn • support [m] • telecom • veteran
39	VPRDPXAM	Exams extract: responds to requests for patient exam data and returns XML-formatted results for the following attributes: • comment • dateTime • encounter • facility • id • name • result

#	Routine	Description
40	VPRDPXED	Education topics extract: responds to requests for patient education data and returns XML-formatted results for the following attributes: • comment • dateTime • encounter • facility • id • name • result
41	VPRDPXHF	Health Factors extract: responds to requests for data from the Health Factors package and returns XML-formatted results for the following attributes: • category • comment • encounter • facility • id • name • recorded • severity
42	VPRDPXIM	Immunizations extract: responds to requests for immunization data and returns XML-formatted results for the following attributes: • administered • comment • contraindicated • cpt • encounter • facility • id • location • name • provider • reaction • series

#	Routine	Description
43	VPRDPXSK	Skin tests extract: responds to requests for skin-test results and returns XML-formatted results for the following attributes: • comment • dateTime • encounter • facility • id • name • result
44	VPRDRA	Radiology exams extract: responds to requests for radiology exam data, directly or via the Procedures extract, and returns XML-formatted results for the following attributes: • case • category • dateTime • document [m] • encounter • facility • hasImages • id • imagingType • interpretation • location • modifier [m] • name • order • provider • status • type
45	VPRDSDAM	Appointments extract*:* responds to requests for future scheduled visits and returns XML-formatted results for the following attributes: • apptStatus • clinicStop • dateTime • facility • id • location • patientClass • provider • service • serviceCategory • type • visitString

#	Routine	Description
46	VPRDSR	Surgical procedures extract: responds to requests for surgery data, directly or via the Procedures extract, and returns XML-formatted results for the following attributes: • category • dateTime • document [m] • encounter • facility • id • modifier [m] • name • opReport • otherProcedure [m] • provider • status • type
47	VPRDTIU	Documents extract: responds to requests for documents and returns XML-formatted results for the following attributes: • category • clinician [m] • content • documentClass • encounter • facility • id • images • localTitle • loinc • nationalTitle • nationalTitleRole • nationalTitleService • nationalTitleSetting • nationalTitleSubject • nationalTitleType • parent • referenceDateTime • status • subject • type

#	Routine	Description
48	VPRDVSIT	Visits and encounters extract: responds to requests for visit data (inpatient and outpatient encounters) and returns results in XML-format for the following attributes (returns only primary, non-historical visits): • creditStopCode • dateTime • document [m] • facility • id • location • patientClass • provider [m] • reason • service • serviceCategory • stopCode • type • visitString For admissions only: • arrivalDateTime • departureDateTime • provider [m] • roomBed • specialty
49	VPRJSON	JSON services: responds to requests for JSON decoding and encoding and forwards these requests to VPRJSOND and VPRJSONE, respecitvely
50	VPRJSOND	JSON decoding service: responds to JSON decode requests, returns unformatted results
51	VPRJSONE	JSON encoding service: responds to JSON encode requests; returns JSON-formatted results
52	VPRP2I	VPR post initialization routine
53	VPRUTILS	VPR utilities routine: contains utility functions, such as functions for formatting dates and functions for universal identifier (UID) strings

XML Example

The following text paragraph contains a snippet of data that the VPRDGMV routine returned in response to a VPR GET PATIENT DATA RPC call for information about vitals measurements for VPRTestPatient, One:

```
<vital>
<entered value='3050316.115625' />
<facility code='998' name='ABILENE (CAA)' />
<location code='158' name='7A GEN MED' />
<measurements>
<measurement id='14871' vuid='4500634' name='BLOOD PRESSURE'
value='168/68' high
='210/110' low='100/60' />
<measurement id='14869' vuid='4500636' name='PULSE' value='72'
high='120' low='60' >
<qualifiers>
<qualifier name='RADIAL' vuid='4688678' />
</qualifiers>
</measurement>
<measurement id='14872' vuid='4500635' name='PAIN' value='1' />
<measurement id='14870' vuid='4688725' name='RESPIRATION' value='18'
high='30' low='8' >
<qualifiers>
<qualifier name='SPONTANEOUS' vuid='4688706' />
</qualifiers>
</measurement>
<measurement id='14868' vuid='4500638' name='TEMPERATURE' value='99'
units='F' metricValue='37.2' metricUnits='C' high='102' low='95' >
<qualifiers>
<qualifier name='ORAL' vuid='4500642' />
</qualifiers>
</measurement>
</measurements
<taken value='3050316.1' />
</vital>
```

JSON Example

The following text paragraph contains a snippet of data that the VPRDJ02 routine returned in response to a VPR GET PATIENT DATA JSON call for vitals-related information about VPRTestPatient, One—the same patient for whom VPRDGMV returned vitals information in the XML example:


```
{"apiVersion":"1.01","params":{"domain":"DEV.HMPDEV.VAINNOVATIONS.US","syst
emId":"F484"},"data":{"updated":"20130718143517","totalItems":5,"items":[{"
displayName":"BP","facilityCode":"500D","facilityName":"SLC-FO HMP
DEV","high":"210\/110","kind":"Vital
Sign","localId":14871,"locationName":"7 WEST MEDICINE",

"locationUid":"urn:va:location:F484:158","low":"100\/60","observed":2005031
61000,"result":"168\/68","resulted":20050316115625,"summary":"BLOOD
PRESSURE 168\/68mm[Hg]","typeCode":"urn:va:vuid:4500634","typeName":"BLOOD
PRESSURE","uid":"urn:va:F484:229:vital:14871","units":"mm[Hg]"}

,
{"displayName":"P","facilityCode":"500D","facilityName":"SLC-FO HMP
DEV","high":120,"kind":"Vital sign","localId":14869,"locationName":"7 WEST
MEDICINE","locationUid":"urn:va:location:F484:158","low":60,"observed":2005
03161000,"qualifiers":[{"name":"RADIAL","vuid":4688678}],"result":72,"resul
ted":20050316115625,"summary":"PULSE 72
\/min","typeCode":"urn:va:vuid:4500636","typeName":"PULSE","uid":"urn:va:F4
84:229:vital:14869","units":"\/min"}

,
{"displayName":"PN","facilityCode":"500D","facilityName":"SLC-FO HMP
DEV","kind":"Vital Sign","localId":14872,"locationName":"7 WEST
MEDICINE","locationUid":"urn:va:location:F484:158","observed":200503161000,
"result":1,"resulted":20050316115625,"summary":"PAIN 1
","typeCode":"urn:va:vuid:4500635","typeName":"PAIN","uid":"urn:va:F484:229
:vital:14872","units":""}

,
{"displayName":"R","facilityCode":"500D","facilityName":"SLC-FO HMP
DEV","high":30,"kind":"Vital Sign","localId":14870,"locationName":"7 WEST
MEDICINE","locationUid":"urn:va:location:F484:158","low":8,"observed":20050
3161000,"qualifiers":[{"name":"SPONTANEOUS","vuid":4688706}],"result":18,"r
esulted":20050316115625,"summary":"RESPIRATION 18
\/min","typeCode":"urn:va:vuid:4688725","typeName":"RESPIRATION","uid":"urn
:va:F484:229:vital:14870","units":"\/min"}
```

Checksums

The following table contains checksums for theVPR GET PATIENT DATA and VPR GET PATIENT DATA JSON routines.

#	Routine	Checksum
1	VPRD	29175301
2	VPRDCRC	46793433
3	VPRDGMPL	27827751
4	VPRDGMRA	22392321
5	VPRDGMRC	10880986
6	VPRDGMV	41671211
7	VPRDGPF	5569926
8	VPRDIB	12692505
9	VPRDJ	22186238
10	VPRDJ0	87481337
11	VPRDJ00	58623073
12	VPRDJ01	39474581
13	VPRDJ02	43626306
14	VPRDJ03	49743518
15	VPRDJ04	47678729
16	VPRDJ04A	36420588
17	VPRDJ05	76359424
18	VPRDJ05V	45875553
19	VPRDJ06	49853799
20	VPRDJ07	19635784
21	VPRDJ08	60175705
22	VPRDJ08A	39219672
23	VPRDJ09	37647658
24	VPRDJT	9998610
25	VPRDLR	24009801
26	VPRDLRA	76865545
27	VPRDLRO	27947758
28	VPRDMC	58353015
29	VPRDMDC	58663659
30	VPRDOR	13221791
31	VPRDPROC	10570617
32	VPRDPS	18817165

#	Routine	Checksum
33	VPRDPSI	41207623
34	VPRDPSO	15569449
35	VPRDPSOR	39128356
36	VPRDPT	70553505
37	VPRDPXAM	9620825
38	VPRDPXED	9831355
39	VPRDPXHF	10068928
40	VPRDPXIM	15866293
41	VPRDPXSK	9706647
42	VPRDRA	41770325
43	VPRDSDAM	20114385
44	VPRDSR	30371946
45	VPRDTIU	81103735
46	VPRDVSIT	89271062
47	VPRJSON	11235996
48	VPRJSOND	63619549
49	VPRJSONE	20857447 and
50	VPRP2I	236349
51	VPRPI << post install routine	300624
52	VPRUTILS	9723974

Options

Name	Description
VPR APPLICATION PROXY	This option allows the VPR connector proxy access to the VistA system.
VPR TEST JSON	This option allows VPR testers to view JSON-formatted extracts.

VPR TEST JSON Option

The VPR TEST JSON option loops around its DOMAIN and PATIENT prompts, making it easy for testers to display data for successive patients and domains. The option asks for a start date. If testers provide a start date, it also asks for a stop date. The option's start and stop parameters enable testers to limit data displays to a time-bound subset of available data. If testers do not provide a start date, the option does not ask for a stop date and displays all available data for the patient and domain testers specify.

Glossary

Acronyms

Term	Description
CLiO	Clinical Observations
CRC	Cyclic Redundancy Check
DBIA	Database Integration Agreement
EDIS	Emergency Department Integration Software
hi^2	Health Informatics Initiative
HMP	Health Management Platform
ICR	Integration Control Reference
IV	Intervenous
JSON	JavaScript Object Notation
NwHIN	Nationwide Health Information Network
PCE	Patient Care Encounter
PTF	Patient Treatment File
UID	Universal Identifier
RPC	Remote Procedure Call

Term	Description
VistA	Veterans (Health) Information System Technology Architecture
VPR	Virtual Patient Record
XML	Extensible Markup Language