

Publishing First Dose COVID-19 Vaccine Appointment Availability with Epic

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Publishing First Dose COVID-19 Vaccine Appointment Availability with Epic

Epic supports the [SMART Scheduling Links standard](#), a lightweight appointment availability publishing API designed to make it easy for Epic organizations to publish COVID vaccine appointment slot availability in cooperation with outside websites, vendors, or government programs.

This document describes the standard as Epic has implemented it.

Interacting with Epic FHIR Web Services

Epic's SMART Scheduling Links web services might in some cases return references to FHIR resources, such as Location resources. However, these resource identifiers are not currently compatible with other Epic FHIR APIs, and users of the SMART Scheduling Links web services cannot resolve those references using Epic's FHIR APIs.

Supported API Endpoints

The following API endpoints are supported by Epic.

Endpoint Type	Endpoint URL
Manifest File	<code>/api/epic/2021/FHIR/COVID/covid-vaccine-availability/\$bulk-publish/</code>
Location File	<code>/api/epic/2021/FHIR/COVID/covid-vaccine-availability/{state-code}/Location</code>
Schedule File	<code>/api/epic/2021/FHIR/COVID/covid-vaccine-availability/{state-code}/Schedule</code>
Slot File	<code>/api/epic/2021/FHIR/COVID/covid-vaccine-availability/{state-code}/Slot</code>

Endpoint Details

This section explains the structure of the API response for each supported endpoint. Some of these details are copied from the public specification, which is [published here](#). Certain details have been updated to account for differences in Epic's implementation of the specification.

Manifest File

As described in the public specification, "the manifest is a JSON file serving as the entry point for slot discovery. It provides links that clients can follow to retrieve all the other files."

Field Name	Type	Description
transactionTime	ISO8601 timestamp as string	The time when this data set was last refreshed.
request	URL as string	The full URL of the manifest.
output	array of JSON objects	Each object contains a type, URL, and extension field.
→ type	string	Whether this output item represents a "Location," "Schedule," or "Slot" file.
→ url	URL as string	The full URL of an NDJSON file for the specified type of data
→ extension	JSON object	Contains tags to help a client decide which output files to download.
→ → state	JSON array of strings	State or jurisdiction abbreviations (e.g., ["MA"] for a file with data pertaining solely to Massachusetts).

Sample Manifest Response

```
{
  "transactionTime": "2021-03-15T14:58:06Z",
  "request": "https://hostname/instance/api/epic/2021/FHIR/COVID/covid-vaccine-availability/$bulk-publish/",
  "output": [
    {
      "type": "Location",
      "url": "https://hostname/instance/api/epic/2021/FHIR/COVID/covid-vaccine-availability/WI/Location",
      "extension": {
        "state": [
          "WI"
        ]
      }
    },
    {
      "type": "Slot",
      "url": "https://hostname/instance/api/epic/2021/FHIR/COVID/covid-vaccine-availability/WI/Slot",
      "extension": {
        "state": [
          "WI"
        ]
      }
    }
  ]
}
```

```

    }
  },
  {
    "type": "Schedule",
    "url": "https://hostname/instance/api/epic/2021/FHIR/COVID/covid-vaccine-availability/WI/Schedule",
    "extension": {
      "state": [
        "WI"
      ]
    }
  }
],
"error": []
}

```

Location File

As described in the public specification, "each line contains a minified JSON object representing a physical location where appointments are available."

Field Name	Type	Required	Description
resourceType	string	Y	Fixed value of "Location."
id	string	Y	Unique identifier for this location (up to 64 alphanumeric characters and may include - and .)
name	string	Y	The human readable name of the location.
telecom	array of JSON objects	Y	Each object conveys a contact point for this location (<i>Note: This field conveys "general information" contact points, not necessarily for booking appointments; see Slot details for booking URLs and booking phone numbers.</i>)
→ system	string	Y	"phone" or "url"
→ value	string	Y	Phone number or URL for this location.
address	JSON object	Y	Each object conveys a USPS complete address .
→ line	array of strings	Y	Each string is a line in the address.

Field Name	Type	Required	Description
→ city	string	Y	
→ state	string	Y	
→ postalCode	string	Y	
→ district	string	Y	Optional county.
description	string	N	Epic does not populate the description.
position	JSON object	N	Epic does not populate the position.
→ latitude	number	N	Epic does not populate the latitude.
→ longitude	number	N	Epic does not populate the longitude.
identifier	array of JSON objects	N	Identifiers for this location (e.g., VTrckS PIN, DEP .1). See below. With Epic, this is populated based on configuration in Identity.

Each `identifier` object includes a `system` and a `value`.

- "VTRckS PIN" (see <https://cdc.gov/vaccines/programs/vtrcks> for VTrckS program details):

Field Name	Type	Description
system	string	Fixed value of <code>"https://cdc.gov/vaccines/programs/vtrcks"</code>
value	string	VTrckS PIN for this location

- Department ID (DEP .1):

Field Name	Type	Description
system	string	Unique URN corresponding to your organization
value	string	Department ID

- Additional identifiers: Any number of additional identifiers MAY be included. Each should populate `system` and `value` as appropriate.

Sample Location Response

```
{
  "resourceType": "Location",
  "id": "OXXAYUbmy39s793u87iw",
  "name": "Initial Department",
  "telecom": [
    {
      "system": "phone",
      "value": "608-555-5555"
    }
  ],
  "address": {
    "line": [
      "555 Epic Way",
      "Building 101"
    ],
    "city": "MADISON",
    "state": "WI",
    "postalCode": "53593",
    "district": "DANE"
  },
  "identifier": [
    {
      "system": "coding-system.org",
      "value": "76756J"
    },
    {
      "system": "urn:oid:1.2.840.114350.1.13.5826.1.7.5.737384.931",
      "value": "1234"
    }
  ]
}
```

Schedule File

As described in the public specification, "each line contains a minified JSON object representing the calendar for a healthcare service offered at a specific location."

Field Name	Type	Description
resourceType	string	Fixed value of "Schedule"
id	string	A unique identifier for this schedule (up to 64 alphanumeric characters and may include - and .)
actor	array with one JSON object	
→ reference	string	The location where appointments are available formed as Location + / + the id value of an entry in a Location File (e.g., "Location/123")
serviceType	array of JSON objects	Each object is a standardized concept indicating what services are offered. For COVID-19 immunization schedules, two standardized codings are included: "system": "http://terminology.hl7.org/CodeSystem/service-type" with "code": "57" and "system": "http://fhir-registry.smarthealthit.org/CodeSystem/service-type" with "code": "covid19-immunization".

Each Schedule object may optionally include the following extension JSON object in the Schedule's extension array.

- "Vaccine Product" extension: used to convey a product code for a vaccine available at appointments on this Schedule. This extension SHOULD NOT repeat; providers SHOULD represent each available vaccine product on a separate schedule to facilitate directed booking.

Field Name	Type	Description
url	string	Fixed value of "http://fhir-registry.smarthealthit.org/StructureDefinition/vaccine-product"
valueCoding	JSON object	Coded representation of a vaccine product (CVX code)
→ system	string	Fixed value of "http://hl7.org/fhir/sid/cvx"
→ code	string	Any valid CVX code (e.g., "207", "208", "210", "212")
→ display	string	Display name for the code

Sample Schedule Response

```
{
```



```

"resourceType": "Schedule",
"id": "gMwxTW3LAg07o01ap178h7NRvYids8tZjCKWjpPb0",
"actor": [
  {
    "reference": "Location/OXXAYUbmy39s793u87iw"
  }
],
"serviceType": [
  {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/service-type",
        "code": "57",
        "display": "Immunization"
      },
      {
        "system": "http://fhir-registry.smarthealthit.org/CodeSystem/service-type",
        "code": "covid19-immunization",
        "display": "COVID-19 Immunization Appointment"
      }
    ]
  }
]
"extension": [
  {
    "valueCoding": {
      "system": "http://hl7.org/fhir/sid/cvx",
      "code": "207",
      "display": "COVID Vaccine Name"
    },
    "url": "http://fhir-registry.smarthealthit.org/StructureDefinition/vaccine-product"
  }
]
}

```

Slot File

As described in the public specification, "each line contains a minified JSON object representing an appointment slot (busy or free) for a healthcare service at a specific location."

Field Name	Type	Required	Description
resourceType	string	Y	Fixed value of "Slot".
id	string	Y	A unique identifier for this slot (up to 64 alphanumeric characters and may include - and .)
schedule	JSON object	Y	Has a single field indicating the Schedule this slot belongs to.
→ reference	string	Y	the schedule for this slot formed as Schedule + / + the id value of an entry in a Schedule File (e.g., "Schedule/123").
status	string	Y	Either "free" or "busy".
start	ISO8601 timestamp as string	Y	The start time of this slot.
end	ISO8601 timestamp as string	Y	The end time of this slot.
extension	array of JSON objects	N	Up to three extensions, as described below.

The possible extensions are:

- "Booking link" extension: used to convey a web link where the user can begin booking this slot.

Field Name	Type	Description
url	string	Fixed value of "http://fhir-registry.smarthealthit.org/StructureDefinition/booking-deep-link"
valueUrl	string	URL that's a deep link into the Provider Booking Portal

- "Booking phone" extension: used to convey a phone number the user can call to book this slot.

Field Name	Type	Description
url	string	Fixed value of "http://fhir-registry.smarthealthit.org/StructureDefinition/booking-phone"
valueString	string	Phone number the user can call to book this slot.

- "Capacity" extension: used to enable aggregated discovery at mass vaccination sites. This extension only appears for Slots with a "free" status.

Field Name	Type	Description
url	string	fixed value of "http://fhir-registry.smarthealthit.org/StructureDefinition/slot-capacity"
valueInteger	number	indicates capacity (e.g., "valueInteger": 300 to advertise a capacity of 300)

Sample Slot Response

```
{
  "resourceType": "Slot",
  "id": "I2d7nJZdugb1wUKDl60unKvjmsgeMVjD25HsrCLV3IJfc6T08GMCa1XYKvLaxK2iCzXeL5fe6XBJpORcYpdQ",
  "schedule": {
    "reference": "Schedule/eq2f49HMqGaAwORDoudS0qYn86UDUtJRAYQ3XEnwJes"
  },
  "status": "free",
  "start": "2021-03-15T00:00:00Z",
  "end": "2021-03-15T23:55:00Z",
  "extension": [
    {
      "valueString": "608-271-5555",
    }
  ]
}
```

```

        "url": "http://fhir-registry.smarthealthit.org/StructureDefinition/booki
ng-phone"
      },
      {
        "valueUrl": "https://example.org/book-immunization&token=%token%",
        "url": "http://fhir-registry.smarthealthit.org/StructureDefinition/booki
ng-deep-link"
      },
      {
        "valueInteger": 8,
        "url": "http://fhir-registry.smarthealthit.org/StructureDefinition/slot-
capacity"
      }
    ]
  }

```

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