

Weave QR Code Format

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Revision 1

Weave uses a QR code to aid the process of securely onboarding (a.k.a. pairing) devices into a user's home. Data within the QR code provides important information to mobile applications (commissioners) that helps to guide the user through the onboarding experience. This includes such things as information about the manufacturer and type of device, information useful in establishing communications with the device, and credentials or other data necessary to authenticate the device.

QR Code Information

The information in a Weave QR code is organized as a set of fields, each with a distinct type. The types of fields that appear within a given QR code vary according to the features and requirements of the associated device. All fields within a Weave QR code are optional. However, in practice, certain key fields, such as Vendor and Product Id, tend to appear in all QR codes.

The set of possible fields within a Weave QR code are a subset of those that can appear within a Weave Device Descriptor TLV structure (minus the fields that vary at runtime). Thus a Weave QR code can be seen as an alternate encoding for a Weave Device Descriptor.

The set of fields that may appear within a Weave QR code are as follows:

Weave Vendor Identifier

A 16-bit identifier uniquely describing a particular product manufacturer or vendor. This value is assigned and administered by Google.

Weave Product Identifier

A 16-bit identifier uniquely describing a particular product made and sold by a manufacturer or vendor. This value is assigned and administered by the vendor.

Product Revision

A 16-bit unsigned integer describing the hardware revision of the product. This value is assigned and administered by the vendor.

Manufacturing Date

The date of manufacture for the product, including a year and month, and optionally including a day of month. The base value for the date is 2000/01/01. This value is assigned and administered by the vendor.

Serial Number

A unique serial number for the product. This should typically correspond to a value physically printed on the product or its packaging. The value is limited to a maximum of 32 characters, and is assigned and administered by the vendor.

Device Id

A 64-bit unsigned integer that uniquely identifies the device. For Weave-enabled devices, this is the Weave node id assigned to the device by the vendor. For other types of devices, this is a unique id managed by the vendor according to their needs.

NOTE: For Weave-enabled devices, this field shall only be present when the device does not include an 802.15.4 interface, or the MAC address assigned to this interface differs from the Weave node id. If the device implements an 802.15.4 interface with a MAC address that matches the Weave node id, this field must be omitted.

802.15.4 MAC Address

The IEEE 802.15.4 MAC address for the primary such interface on the product, if present. This value is assigned and administered by the vendor.

NOTE: For Weave-enabled devices, the value of this field also denotes the device's Weave node id if (and only if) the Device Id field is not present.

802.11 MAC Address

The IEEE 802.11 MAC address for the primary such interface on the product, if present. This value is assigned and administered by the vendor.

Rendezvous WiFi ESSID

For products that support pairing via a WiFi soft access point, this is the ESSID of the access point presented by device.

The value is limited to a maximum of 32 characters and is assigned and administered by the vendor. Vendors are strongly encouraged to include device-specific characters in the rendezvous ESSID to reduce the chance of collision between devices in the field. A preferred pattern is a base name (e.g. "NEST-") followed by 4 trailing hex digits from the device's Weave node id or WiFi MAC address; e.g. "NEST-8EE5".

NOTE: This field is mutually exclusive with the Rendezvous WiFi ESSID Suffix field, implying that both fields cannot appear together within the same QR code string.

Rendezvous WiFi ESSID Suffix

For products that support pairing via a WiFi soft access point, this is a suffix string that will appear at the end of the access point ESSID presented by device. This field can be used by devices where the base portion of ESSID varies at runtime.

The value is limited to a maximum of 32 characters and is assigned and administered by the vendor. Vendors are strongly encouraged to include device-specific characters in the rendezvous ESSID suffix to reduce the chance of collision between devices in the field. A preferred pattern is the last 4 hex digits from the device's Weave node id or WiFi MAC address; e.g. "8EE5".

NOTE: This field is mutually exclusive with the Rendezvous WiFi ESSID field, implying that both fields cannot appear together within the same QR code string.

Pairing Code / Entry Key

A short random string used for confirming proof of physical possession and establishing secure communication with the device. The value is limited to a maximum of 16 characters and is assigned and administered by the vendor.

Pairing Compatibility Major/Minor Version

A two-part version number denoting the device's compatibility with a particular point in the evolution of a pairing procedure. The major and minor values are each limited to a range of 0 to 65535. These values are assigned and administered by the vendor.

QR Content Encoding

Information in a Weave QR code is stored as a text string conforming to the allowed character set defined for alphanumeric QR codes. The string encodes the various fields of the Weave QR code, along with a version identifier. The syntax of this string is as follows:

```
weave-qr-code-string : version field-sequence
```

```
version : [1-9A-Z]
```

```
field-sequence : field  
                | field field-sequence
```

```
field : field-tag ':' field-value '$'
```

```
field-tag : [0-9A-Z]
```

```
field-value : [0-9A-Z%*+./:\- ]+
```

For the current revision of this specification, a value of '1' shall be used for the version character.

Single character tags are used to identify fields within the QR code. For each such tag, a corresponding value syntax and constraints are defined:

Field	Tag	Value Format	Constraints
Vendor Identifier	'V'	Hex Digits	Length: 1 - 4 Range: 0x1 - 0xFFFF
Product Identifier	'P'	Hex Digits	Length: 1 - 4 Range: 0x1 - 0xFFFF
Product Revision	'R'	Hex Digits	Length: 1 - 4 Range: 0x1 - 0xFFFF
Manufacturing Date	'D'	YYMMDD or YYMM	Length: 4 or 6

Serial Number	'S'	Text	Length: 1 - 32
Device Id	'E'	Hex Digits	Length: 16
802.15.4 MAC Address	'L'	Hex Digits	Length: 16
802.11 MAC Address	'W'	Hex Digits	Length: 12
Rendezvous WiFi ESSID	'I'	Text	Length: 1 - 32
Rendezvous WiFi ESSID Suffix	'H'	Text	Length: 1 - 32
Pairing Code	'C'	Text	Length: 1 - 16
Pairing Compatibility Version Major	'J'	Hex Digits	Length: 1 - 4 Range: 0x0 - 0xFFFF
Pairing Compatibility Version Minor	'N'	Hex Digits	Length: 1 - 4 Range: 0x0 - 0xFFFF