

Weave Glossary

Find definitions for terms we use with Weave products.

A

account

An account created at home.nest.com that grants the account owner (user) control of the Nest device via web/mobile applications.

address

Each node in a Weave fabric has an IPv6 unique local address (ULA).

application layer

Weave profiles and associated gRPC APIs that provide the shared protocols used to communicate between devices and service hosts.

application layer protocols

Weave protocols that focus on process-to-process communication across an IP network and provide a communication interface and end-user services.

application level security

Weave devices may be included in one or more security domains, which are secured with *domain keys*. The keys include a rolling epoch key and are managed by an authorization service. See [authorization service](#).

authorization service

Service that authenticates devices and clients of the Weave system, and provides to devices and clients authorized application keys and rolling epoch keys used to implement application level security. See [application level security](#).

B

BLE

A wireless radio protocol supported by Weave.

border router

A device in the home area network (HAN) that routes Weave messages between Thread and Wi-Fi networks, and establishes a tunnel between the HAN and the Nest Service.

C

CASE

The Certificate-assisted Session Establishment (CASE) protocol is the primary Weave secure session establishment protocol using Weave certificates. This can be a *hardware certificate* or an application level security certificate provided by the authorization service. See [Weave certificate](#).

command

A Weave message type. Commands are requests for action on a trait with an expected response. Commands may have parameters and a response with a status and parameters. Property changes are effected with the standard `update` command, while properties can be viewed and monitored with the standard `observe` command. There

are two message types in Weave. The other message type is event. See [event](#).

controller

Controllers are services that implement advanced functionality. Examples include the Lighting group controller, HVAC zone controller, and Occupancy arbiter controller.

D

device ID

Type of node ID. Each device has a 64-bit globally unique ID assigned at manufacturing time. It is tied to the device certificate for authenticating the device's identity. Used as a node ID for devices. See [node ID](#).

E

event

A Weave message type. An event is an unidirectional assertion of truth about a trait at a specific time, with no expected response. For example, a pincode entered to unlock a deadbolt generates an event. The most common events are property changes expressed with the special-purpose `notify` event. There are two message types in Weave. The other message type is command. See [command](#).

F

fabric key

A key unique to each Weave fabric generated by the first device creating the fabric, and used to pair subsequent devices to the fabric.

fabric ID

A unique 64-bit value that globally identifies the Weave fabric. Randomly generated when a Nest device is introduced to a structure for the first time.

fabric provisioning

Pairs devices to the local Weave fabric by providing the fabric ID and fabric key necessary to communicate with other devices and services.

factory provisioning

A manufacturing process that preconfigures devices with Weave profiles and a hardware certificate.

front-end module (FEM)

An integrated circuit (IC) that includes all the components necessary to process an incoming radio frequency (RF) signal into an intermediary frequency (IF) or into a digital form.

H

hardware certificate

A Weave certificate that is factory-provisioned at manufacturing time onto a device. This certificate is used to authenticate the device when pairing the device to the Weave fabric, and to the Nest Service.

Home area network (HAN)

A networked set of devices in the home that can be part of a Weave fabric, and which provides secure wireless communications.

I

in-field provisioning

Supplies deployed devices the information they need to be full participants in a Weave fabric.

interface

A set of traits that describe a higher-level functionality. For example, the functionality for a colored light contains the traits OnOff, Level, and Color, all of which work together to implement the ColorLight interface. Defined in the Weave schema.

L

leaving a fabric

Breaking the relationship between a member node and the rest of the nodes in a Weave fabric, transforming the node to an independent node. If a node leaves a Weave fabric consisting of only two nodes, the fabric ceases to exist.

M

messages

Formatted data passed between nodes in the same network to effect change or communicate information.

metadata

Information placed on various schema components to formally constrain or further describe that component, for example, marking a trait property as "read-only."

N

NCP

Network coprocessor. An NCP implementation places the Thread stack on one integrated circuit, while the Weave and application software reside on a second chip. See [SoC](#).

Nest API

A real-time data API offering subscription-based access to data shared by Nest devices. With the [Nest API](#), you can build products that access Nest device data to read or write shared data values.

Nest Service

A cloud-based infrastructure that connects HAN devices into a data model, provides remote access, and implements intelligent controllers to create a comprehensive ecosystem.

network provisioning

The act of establishing connectivity between a device and the local Wi-Fi or Thread network. It can involve supplying a network ID and routing information or network access credentials, such as the Wi-Fi pre-shared key.

node

A Weave device or service host that is capable of participating in a Weave fabric. Every node in the fabric has a unique IPv6 address. See [service host](#) and [Weave fabric](#).

node-acquired address

IPv4 or IPv6 address assigned to a device by the end user's network infrastructure, such as via DHCP.

node ID

A unique 64-bit value that globally identifies a node in the Weave fabric.

O

OTA

Over-the-air firmware updates.

P

pairing

The process of joining a device to a home network, Weave fabric, and Nest Service user account.

pairing code

Character code used to pair the device with the Weave fabric. This is encoded in the Weave Device Descriptor and printed alongside the QR code to enable pairing. See [Weave Device Descriptor](#).

PASE

Password-authenticated session establishment, a protocol for mutual authentication, used to establish the initial secure session between two Weave devices using the pairing code.

property

Properties are characteristics of a trait that represent the state of a resource. For example, the brightness of a light or whether someone is home. Comprises type, name, tag, and metadata, such as default value and constraints. Defined in the Weave schema.

protocol

Defines the packet structure of the data transmitted, as well as the control commands that manage a session.

R

resource configuration

Configuration of how the traits of a particular resource definition are implemented between a device and controllers. Defined in the Weave schema.

resource handler

A resource proxy created in the Nest Service for every device in the HAN, to enable remote access to the device.

resource ID

Globally unique resource identifier. For devices, this is the device ID. Other non-device resources are assigned by the Nest Service when they are created.

resource proxy

Replicated handler of a resource's traits used for locality of data or to handle sleepy endpoints. A proxy manages properties and queues resource commands.

resource

A logical or physical thing, such as a device, structure, or user. It comprises a set of trait and interface instances that describe its capabilities and behaviors. Defined in the Weave schema.

RTOS

Real-time operating system used on constrained microcontrollers. Weave uses FreeRTOS.

S

schema

A formal description of standard and vendor-specific traits and interfaces.

service directory

A directory service available on a Weave fabric.

service endpoint

A Nest Service endpoint implementing a specific Weave profile protocol addressed by a single service endpoint ID in the Weave fabric.

service endpoint ID

A type of node ID. Each service endpoint defined in the Nest Service is identified by a service endpoint ID. The IDs are unique, assigned by Nest, and will never change.

service host

The entity (device, service, or app) responsible for a specific trait. Responsibilities include managing state, responding to commands, and triggering events.

service provisioning

Associates a Weave device with the Nest Service and a user account.

SoC

System on a chip. In SoC implementations, the Thread, Weave, and application software all reside on a single integrated circuit. Compare to NCP.

state

The set of property values associated with a resource and trait at a particular time. The state of a resource is composed of the states of its traits. See [resource](#), [trait](#), and [state](#).

state event

A standard subset of events used for notification of a state change on a resource or trait.

T

TLV

Type-length-value encoding used for compact binary data serialization.

trait

Reusable unit of functionality composed of properties, events, commands, and metadata. Defined in the Weave schema.

tunnel

A secure route established by a border router for transferring Weave IPv6 UDP messages between the HAN and the Nest Service.

U

user

A person who owns a Nest device, has a Nest account, has installed a Nest device in a structure, and has connected their device with the Nest Service.

V

Vendor ID

Unique 16-bit identifier for the company of origin used for namespacing vendor-specific trait and resource type definitions.

vendor registry

A logical service infrastructure component that contains the mapping of Vendor IDs to vendors and allows Weave to read existing vendor information and create new vendors.

vendor trait extension

A vendor-specific extension to a standard trait which can add properties, property value constraints, commands, command arguments, and events. Only available within the vendor's namespace. See [trait](#).

W

Weave

Network and application protocol designed to support connected products. It provides a secure, robust communications platform for connected devices and is already running in Nest products around the world.

Weave certificate

A data-reduced and Weave TLV-encoded X.509-style elliptic curve cryptography (ECC) certificate used to establish secure sessions between Weave nodes.

Weave Data Language

A descriptor language that defines the Weave schema, including resource, interface, trait, and service definitions.

Weave Data Management

An application protocol used for real-time trait management. Weave Data Management provides compact operations for the `update` and `observe` commands, providing asynchronous notifications of property state changes.

Weave Device Descriptor

Data encoded into a QR code printed on a device providing information required to pair the device to the network. Includes the pairing code and the product type and version. See [pairing code](#).

Weave fabric

A network consisting of all connected home devices, the Nest Service, and mobile devices. The fabric enables connected devices to securely cooperate in providing services to the user, their family, and guests.

Weave profile

The set of tags and messages defining application layer protocols on Weave, such as Weave Data Management for managing trait data, or time services for synchronizing time.

Weave Reliable Messaging protocol

A lightweight messaging protocol for Weave to send messages reliably between two devices in a Weave fabric.

Weave SDK

Nest's RTOS and Linux implementation of the Weave communications stack, network management, and common Weave profiles, which you use to build device code.