

8.x Spiral Discovery Explained – Feature, Benefits, How is it different from 7.x discovery

HP Network Node Manager i software offers continuous Layer-2 and Layer-3 network discovery as a feature known as Spiral Discovery. This feature avoids episodic loads on the network for management purposes, and allows NNMi to track dynamic changes in near real time. Spiral Discovery uses a variety of MIBs and protocols to reduce overhead and manage multivendor environments. This means that NNMi can discover network topology changes, and use that information, much sooner than previous versions or competitor products. The new architecture improves the CPU and Memory performance of NNMi, so your management system has ample capacity to monitor larger networks and more interfaces. In Spiral Discovery, discovery and inventory data collection occur in stages where each stage provides information that is used to drive subsequent stages. This figure illustrates the process:



You define the starting points for discovery, and your NNMi configuration settings flexibly control address ranges and system object ID ranges, exceptions, and limits to be added to the NNMi database. When a device is identified, Spiral Discovery collects the basic information to understand what kind of device it is. That information, in turn, tells it what additional device inventory information is available and details are then collected, augmenting the inventory with additional information and connections that continue the process.

NNMi gathers information about neighboring devices using ARP cache, DNS, discovery protocols and other protocols including BGP, EIGRP and OSPF. In Wide Area Networks such as ATM, Frame Relay, and Point-to-Point (where ARP cache is not available), the optional Ping Sweep feature locates nodes for Spiral Discovery to use when gathering neighbor information and evaluating connections. A new system for modeling proprietary MIBs lets NNMi define device-specific collections that are incorporated into Spiral Discovery, capturing proprietary inventory information and correctly representing devices in both OSI layer 2 and OSI layer 3 topology. Further, if the device is found to support virtual network services like VPNs, VLANs, routing systems such as multi-protocol label switching (MPLS) and other technologies, then NNMi will develop and maintain the topology of that logical network overlay so it can be depicted for the operator and used in root cause analysis.

In addition to automatic discovery, NNMi also allows for connection editing and subnet connection rules to override the link-level discovery protocol information when needed. A higher precedence connection overwrites a lower precedence one if both data are available and conflict with each other. Discovery protocols employed by Spiral Discovery include CDP (Cisco), EDP (Extreme), NDP (SONMP-Nortel), FDP (Foundry), EnDP (Enterasys), and LLDP (link-level discovery protocol). You can also configure when you would like NNMi to proactively look for new devices and connections.

Benefits of this new technology in NNMi:

- Spiral discovery is dynamic. It continuously discovers the existence of network devices —so network changes are quickly detected and incorporated into topology automatically. The topology is always up-to-date, enabling NNMi operators to identify and troubleshoot problems in real-time as they happen.
- Spiral Discovery is extensive. It collects detailed information about each device, including component health such as CPU, memory, fans, and maintains the detailed inventory information in the NNMi database. Spiral Discovery determines how devices are related to each other in network topology and topology overlays like virtual private networks (VPNs) and virtual LANs (VLANs). It also discovers and understands routing cluster protocols (HSRP, VRRP) and Port Aggregation (NNMi Advanced feature only)
- Spiral Discovery is automatically incorporated into Root Cause Analysis -- When things change in your environment, your topology accurately reflects those changes in near real-time, and the NNMi casual engine reacts to topology changes as they occur for quick analysis of root cause for incidents. In older causal analysis technologies such as codebook approaches, topology changes require a recompile of rules.
- Spiral Discovery is extensible—designed so that HP can easily support new devices with NNMi as they become a part of your network in the future.
- Spiral Discovery benefits not only the core NNMi product, but also all the associated iSPI products which add content, performance, and analysis detail.

Spiral Discovery with NNMi 8.x differs in many ways from the discovery engine which came with NNM 7.x. The NNM 7.x releases used an episodic discovery technology known as Extended Topology (ET) to find and create L2 connections. ET technology depended upon device-specific agents that used a device's SNMP MIBs to acquire device information. The technology was not easily extensible, and changes were not discovered in real-time.

NNMi's Spiral Discovery has dropped the outdated ET technology, as all connectivity logic has been rewritten using updated algorithms written exclusively in Java. Major benefits of refreshing the discovery technology are a reduction in technology complexity, superior node discovery rates and L2 connection creation performance. Moreover, NNMi L2 connection discovery also becomes dynamic and continuous. With properly configured state poll monitoring or via LinkDown/LinkUp traps, the L2 connection are updated instantly to accurately present up-to-date network topology. Competitive offerings still require batch or episodic processing of layer 2 connections.

In summary, NNMi Spiral Discovery is a key new technology that brings unique efficiency and depth to HP's network management solution. HP has a 20-year legacy of commitment and success in this domain. Instead of resting on its laurels, HP has dedicated extensive development resources into NNMi's java-based architecture and components, building an extensible platform to ensure HP will continue its leadership role for the next 20 years.

How does Discovery with NNMi differ from NNM 7.x discovery?

- NNMi has just one consolidated discovery engine and one SNMP stack for both L2 and L3 discovery that is easy to configure. NNM 7.x uses *netmon* and ET technology and 2 SNMP stack for L2 and L3 discovery.
- Discovery is continuous and spiral with NNMi. The NNMi Spiral Discovery process provides ongoing updates to the topology information as changes occur in your network. Topology changes (both inventory and Layer 2) can be discovered more frequently than the scheduled rediscovery interval. Discovery is episodic and batch oriented with NNM 7.x
- NNMi stores all the inventory and discovery information in one relational database – the built-in PostgreSQL database or Oracle database. Having a single relational database for holding all the inventory and discovery information, makes it faster, more reliable and more maintainable and very easy to do an online backup. NNM 7.x stores the data in Topology database, Object database, Map database, ET database which could be proprietary/Solid/oracle/MSSQL. Having different databases, makes it less reliable, and hard to maintain.
- In NNMi, all discovered nodes are counted against the license limit regardless of the management mode (managed , unmanaged , or out of service). You cannot discover nodes

beyond the license limit. With NNM 7.x, you could discover any number of nodes, and license only the nodes you managed.

- NNMi Spiral discovery discovers device component health such as CPU, Memory, Buffers (needs iSPI for Performance) and Sensors such temperature, voltage and fan. This was not discovered in NNM 7.
- Spiral discovery with NNMi Advanced automatically discovers and understands routing cluster protocols (HSRP, VRRP) and Port Aggregation (NNMi Advanced feature only). This feature in 7.x was available with ET discovery

Why do you need to set a discovery period if discovery runs ALL the time?

Continuous Spiral discovery uses "hints", such as the various boot traps, that appear in the network. These traps indicate possible changes in the network and trigger investigation by the discovery engine. If the network is very quiet, or if traps have been disabled, or if there is a trap consolidator, then spiral discovery might be handicapped. To prevent this possibility and to ensure accurate topology, a discovery period is established. Sort of like wearing a belt and suspenders to hold one's pants up.

Is there a way to throttle the discovery with NNMi?

With netmon (NNM 7.x discovery engine) if you set a discovery period to be once per week, netmon would spread that discovery over a 7 day period, thus we could "throttle" discovery to minimize SNMP traffic. There is no way to throttle the discovery with NNMi; it discovers "like crazy" until it completes the discovery and then goes into "hint mode" until the next discovery is triggered. Point here is that we don't have a throttle mechanism in NNMi but neither is SNMP a "heavy" protocol.

Is the Licensing for discovered nodes different than for Managed Nodes?

Yes. In NNMi, all discovered and managed nodes are counted against the license limit regardless of the state of the management mode (managed , unmanaged , or out of service). You cannot discover nodes beyond the license limit. With NNM 7.x, only managed nodes are counted against the license limit. NNM 7.x customer could discover any no. of nodes, and only license the nodes that are managed. Hence, if any of the 7.x customers are using the discovered nodes in their database, (i.e beyond the number of licensed/ managed nodes), they will not be able to now have access to all their discovered nodes unless they buy additional licenses for the discovered nodes as well.

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