Introduction and Update for NetFlow

Session 2218
Agenda

- What Is NetFlow?
- Application Discussion
- What’s New and Road Map
- Quickie on SLM/SAA—NetFlow Vision

What Is NetFlow Components

What Is NetFlow?
NetFlow Enables

- NetFlow statistics empowers users with the ability to characterize their IP data flows
- The who, what, where, when, and how much IP traffic questions are answered

NetFlow’s Value

- NetFlow enables IP traffic flow analysis without probes
- Offers a rich data set to be mined for network management, traffic engineering, and value-added service offerings (i.e. marketing data, personal NMS data)
- Increasing margins on existing Cisco infrastructure is possible and economical with NetFlow usage based billing
Flow-Based Analysis

Seven Keys Define a Flow:
1. Source Address
2. Destination Address
3. Source Port
4. Destination Port
5. Layer 3 Protocol
6. TOS Byte (DSCP)
7. Input Interface

NetFlow Data Exported

NetFlow Data Record

Usage
- Packet Count
- Byte Count
- Source IP Address
- Destination IP Address

Time of Day
- Start Timestamp
- End Timestamp
- Source TCP/UDP Port
- Destination TCP/UDP Port

Port Utilization
- Input Interface Port
- Output Interface Port
- Next Hop Address
- Source AS Number
- Dest. AS Number
- Source Prefix Mask
- Dest. Prefix Mask

QoS
- Type of Service
- TCP Flags
- Protocol
- From/To
- Application
- Routing and Peering
NetFlow Infrastructure

NetFlow Switching:
- Data Switching
- Data Export
- Data Aggregation

NetFlow Collector:
- Data Collection
- Data Filtering
- Data Aggregation
- Data Storage
- File System Management

Network Data Analyser:
- Data Presentation
- NFC Control and Configuration
- Partner Applications

Platform Support in Cisco IOS®
Release 12.0T and 12.0S

Platform Support in Cisco IOS®
Release 12.0T and 12.0S

- Catalyst® 5000/6000 with NFFC
- Cisco 1400/1600
- Cisco 2500/2600
- Cisco 3600
- Cisco 4500/4700
- Cisco AS5300/5800
- Cisco 7200/7500 uBR7200 Available Since 11.1CC/CA
- Cisco MGX™ 8850/8860
- Cisco 4500/4700
- Catalyst 5000/6000 with NFFC
- Cisco 1720
- Cisco 2600
- Cisco 4500/4700
- Cisco AS5300/5800
- Cisco 7200/7500 uBR7200 Available Since 11.1CC/CA
- Cisco MGX™ 8850/8860
- Cisco 4500/4700
### NetFlow FlowCollector

- Flow record reception
- Data volume reduction
  - Filtering
  - Aggregation
- Flat file, binary, and/or compressed file storage
- File cleanup
- Solaris and HP-UX

### Network Data Analyzer

- Graphical display of NetFlow data
- Consumes from NetFlow FlowCollector(s)
- Time-based analysis and data sorting
- Configure routers and FlowCollectors
- Histograms, bar charts, and pie charts
- Spreadsheet data export
Applications

NetFlow Customers

- E-commerce companies
- Large and medium enterprises
- ISPs of all sizes
- CLECs
- Service providers
Applications Mine NetFlow Data and Find:

- Who are my top N talkers
  What percentage of traffic are they?
- How many users are on the network at any given time?
  When will upgrades effect the least number of users?
- How long do my users surf?
- Where do they go?
- Where did they come from?
- Are users staying within an acceptable usage policy (AUP)?
- Alarm DOS attacks like smurf, fraggle, and SYN flood
  Will watch for these attacks destined for anywhere or coming from anywhere!

Used For Traffic Engineering and Capacity Planning

Public Routers 1, 2, 3 Month of September—Outbound Traffic

- 32%
- 20%
- 10%
- 8%
- 6%
- 4%
- 2%
- 1%

Other
Digex
Erois
BBN
AT&T
UMD
C and W
JHU
PACBell Internet Service
NIH
OARnet
SURAnet
Compuserve
OL
ABSNET
WebTV
WEC
Web Hosting and ASP Users

Use this Valuable Information:

- Up-sale opportunities
  - Larger and more servers needed
  - More bandwidth into location
- Sell value-added services
  - Marketing data
  - Usage-based billing

IP Accounting/Billing Many Different Flavors!

- Flat-rate billing doesn’t always scale
  - Competitive pricing models can be created with usage-based billing
- Usage-based billing considerations
  - Time of day: Within my network or off
  - Application: Distance-based
  - QoS/CoS: Bandwidth usage
  - Transit or peer: Data transferred
  - Traffic class (i.e. going through a secure tunnel, high-speed link, or special arrangement)
POP NetFlow Data Collection

Access Devices
Head End, MUX, Customers, Routers???

Carrier A
Carrier Z

Network Core

Edge Aggregation

Server Farm—Access Router

Carrier A
Carrier X

Server
Server
Server
Server
Server

NFC
Metered Service

Collector Can Be at Customer Site or POP Depending on POP Ownership/Co-Location Issues

What’s New and Road Map
Router-Based Aggregation
Here Now!

NetFlow

Port-Protocol Type
Source Prefix
Destination Prefix
Prefix Matrix
AS Matrix

Infrastructure
NetFlow Partners

Billing
Traffic Analysis

Consulting
Mediation

* Bought by Amdocs

BELL SYSTEMS
PORTAL
SOLUTE
Apogee
InfoVista
caida
Andersen Consulting
STRIKE
EXPANDING
PREDICTIVE SYSTEMS!
NARUS
Hewlett-Packard
xacct
Recent Deliveries and Roadmap

- **Scalability**
  - Sampled NetFlow for GSR (Engine 0 and 1)
  - Minimum prefix
  - RBA/TOS support

- **MPLS support**
  - Phase 1 egress PE only and no label information provided

- **Availability**
  - ifIndex persistence
  - Redundant data streams

- **MPLS support**
  - Phase 2, MPLS details—Not yet defined

Service Level Management (SLM)
Service Assurance Agent (SAA) Today

Increasing Service Value

- HTTP
- DLSw
- Voice Jitter
- Packet Loss
- DNS/DHCP
- Path Echo
- Latency
- Voice Jitter Packet Loss
- Path Echo
- Latency
- TCP
- UDP
- ICMP

Cisco IOS-Based Service Assurance* Agent

*With Cisco IOS 12.0(5)T

SA Agent Strategy

BU and Business Partner Applications

- Health Reports
- Service Level Reports
- Exceptions Reports
- Trend Reports

SA Agent-Based Measurements

- Applications
- Network Services
- Network Infrastructure
- PING, TCP, UDP
- DNS, HTTP, DHCP, VoIP
- Jitter,
- SAP/R3, Oracle Apps, PeopleSoft, Sybase SQL, Oracle SQL, MS SQL

* Formerly known as RTR Agent
Integral Part of SLM Solution

**SAA**
- Latency
- Loss
- Jitter
- Server Delay
  (HTTP, DNS, TCP Connect)

**NetFlow**
- From where
- To Who
- When
- How Much
- What App
- What ToS
Information Sources

• Mail alias
  cs-netflow@cisco.com

• Web
  www.cisco.com/go/netflow

Thank You
Introduction and Update for NetFlow
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Please Complete Your Evaluation Form
Session 2218
### NetFlow Platform Support

**NetFlow Platform Support**

<table>
<thead>
<tr>
<th>Cisco IOS™ Software Release Version</th>
<th>Supported NetFlow Export Version(s)</th>
<th>Supported Cisco Hardware Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1CA, 11.1CC</td>
<td>v1, v5</td>
<td>7200, 7500, RSP7000</td>
</tr>
<tr>
<td>11.2, 11.2P</td>
<td>v1</td>
<td>7200, 7500, RSP7000</td>
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<tr>
<td>11.2P</td>
<td>v1</td>
<td>Route Switch Module (RSM), 11.2(10)P and later</td>
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<tr>
<td>11.3, 11.3T</td>
<td>v1</td>
<td>7200, 7500, RSP7000</td>
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<tr>
<td>12.0</td>
<td>v1, v5</td>
<td>1720, 2600, 3600, 4500, 4700, AS5800, 7200, uBR7200, 7500, RSP7000, RSM</td>
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<tr>
<td>12.0T</td>
<td>v1, v5</td>
<td>1720, 2600, 3600, 4500, 4700, AS5800, 7200, uBR7200, 7500, RSP7000, RSM, MGX 8800 RPM, BPX 8600</td>
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<tr>
<td>12.0(3)T and later</td>
<td>v1, v5, v8</td>
<td>1400*, 1600*, 1720, 2500*, 2600, 3600, 4500, 4700, AS5800, AS5300**, 7200, uBR7200, 7500, RSP7000, RSM, MGX8800 RPM, BPX 8650</td>
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<tr>
<td>12.04XE</td>
<td>v1, v5, v8</td>
<td>7100</td>
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<td>N/A</td>
<td>v7</td>
<td>Catalyst 5K NetFlow Feature Card (NFFC) Catalyst 6K with MSFC card</td>
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<tr>
<td>12.0(6)S</td>
<td>v8</td>
<td>12000</td>
</tr>
</tbody>
</table>

*Support for NetFlow Export v1, v5, and v8 on 1600 and 2500 platforms is targeted for Cisco IOS software release 12.0(5)T. NetFlow support for these platforms will not be available in the Cisco IOS 12.0 mainline release.

**Support for NetFlow Export v1, v5, and v8 on AS5300 platform is targeted for Cisco IOS software release 12.0(7)XR.**