

# Measuring and Analyzing Traffic with JUNOS

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# Agenda

- **Introduction**
- **Traditional Traffic Analysis with JUNOS**
  - Collection of measurements
  - Local handling of measurement data
  - Exporting of measurement data
- **Specialized Applications on top of JUNOS**
  - Partner Solution Development Platform (PSDP)
  - Applicability of PSDP for Traffic Analysis

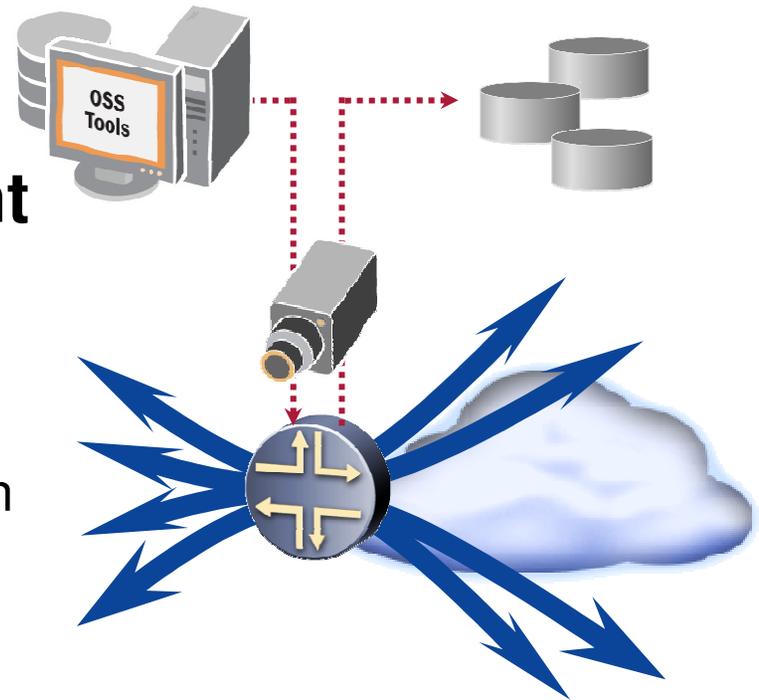
## Introduction

- **Measurements are important**

- Measuring = knowing
- Final goals might differ
  - Traffic Matrix Estimations
  - Network Topology Optimization
  - Billing
  - Peering Reconsiderations
  - ...

- **But LESS important than forwarding**

- Should be absolutely non-destructive
- Should also not cause additional delay or jitter
- Should also not impact other services

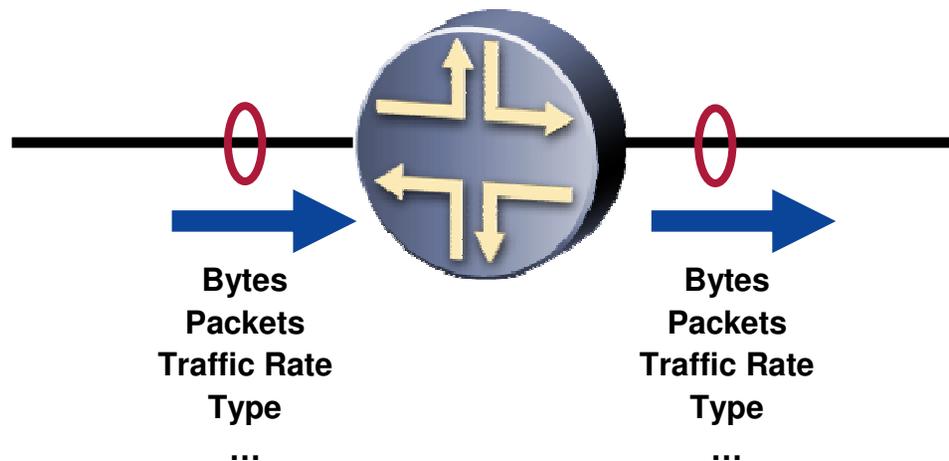


## Collection of measurements - 1

### ■ Traffic information collected at Input or Output

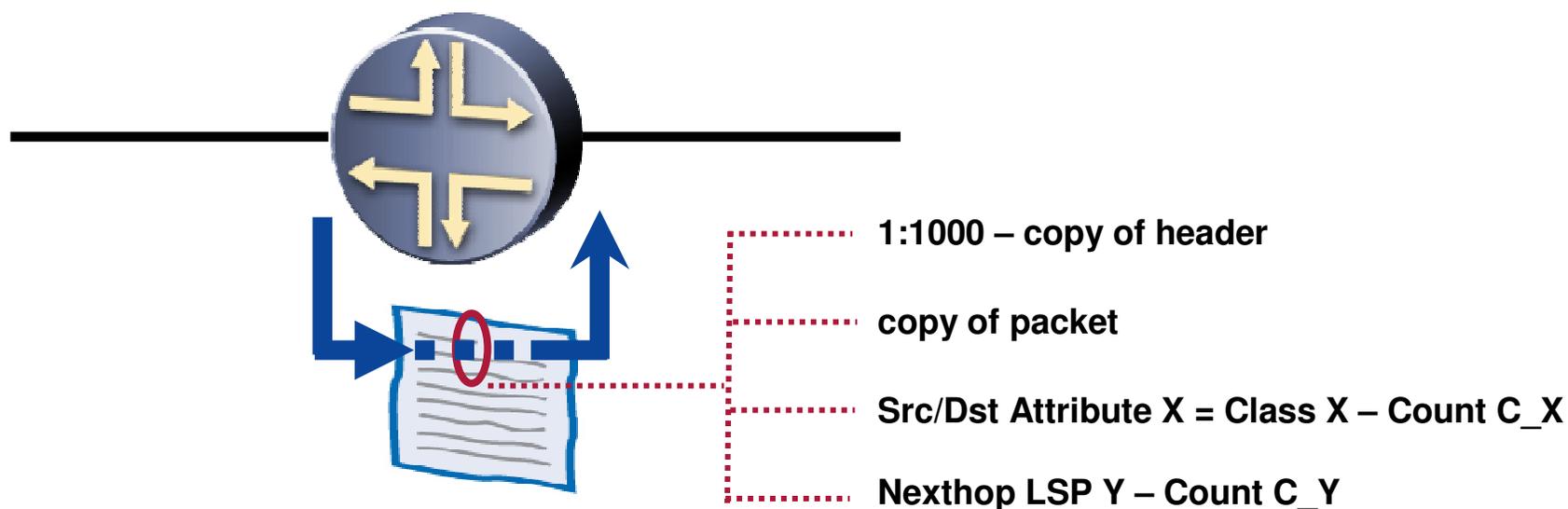
- Interface Statistics
- Queue Statistics
- Firewall (ACL) Counters\*
- ...

\*Implemented at Forwarding



## Collection of measurements - 2

- **Traffic information collected during Forwarding**
  - Sampling
  - Mirroring
  - Source/Destination Class Usage (SCU/DCU)
  - MPLS LSP Statistics



## Local handling of measurement data - 1

### ■ Simple handling of the data

- With native storage
  - Examples: I/O Statistics, SCU/DCU, Filter Counters
  - In various registers, variables, memory locations ...
  - Typically done on PFE with (bulk) transfer to RE\*
- Without storage
  - Example: Mirroring
  - No local storage
  - PFE only activity

\* RE = Routing Engine (Control Plane)

PFE = Packet Forwarding Engine (Forwarding Plane)

## Local handling of measurement data - 2

- **Advanced handling of the data**
  - Sampling Data Files
    - Example: Sampling
    - (Aggregated) Header information
    - By default on RE
    - Can be done within PFE (MS-PIC) for better scaling\*
  - Accounting Profiles
    - Examples: I/O Statistics, Filter Counters, SCU/DCU
    - Periodical storage in user configurable file
  - MPLS Statistics File
    - Example: Per LSP Statistics
    - Periodical storage in user configurable file

\* MS-PIC = MultiServices Physical Interface Card

## Exporting of measurement data

- **Through human user interface**
  - CLI or GUI
- **Towards server**
  - SNMP
  - XML
  - FTP
    - Triggered by script (running locally or on server)
  - Accounting Profiles
    - User configurable data exchange parameters for stored files
  - NetFlow
    - v5, v8 and/or v9

## Need more choices?

- **The JUNOS Traffic Analysis toolset**
  - Is very flexible and scalable
  - Allows for many different choices and combinations
  - ...
  
- **But what if you need more or something else?**
  - Different data fields to be collected
  - Inter-router cooperation
  - Interoperability with non-standard applications
  - ...
  
- **Then Juniper's New PSDP might be the answer**

## Partner Solution Development Platform (PSDP)

- **Enables licensed partners (including customers) to build applications on JUNOS software**
  - 3rd party developed apps can run on or integrate with JUNOS
  - Accelerates innovation for the delivery of revenue-generating services and improved operations
- **Powerful set of resources includes software development kit (SDK)**
  - Intelligent and secure interfaces to JUNOS routing and service functions



# How the PSDP Works

## Routing Engine (RE-SDK)

- Routing and control functions
- Slow path packet processing
- User interface extension

## Partner Solution Development Platform

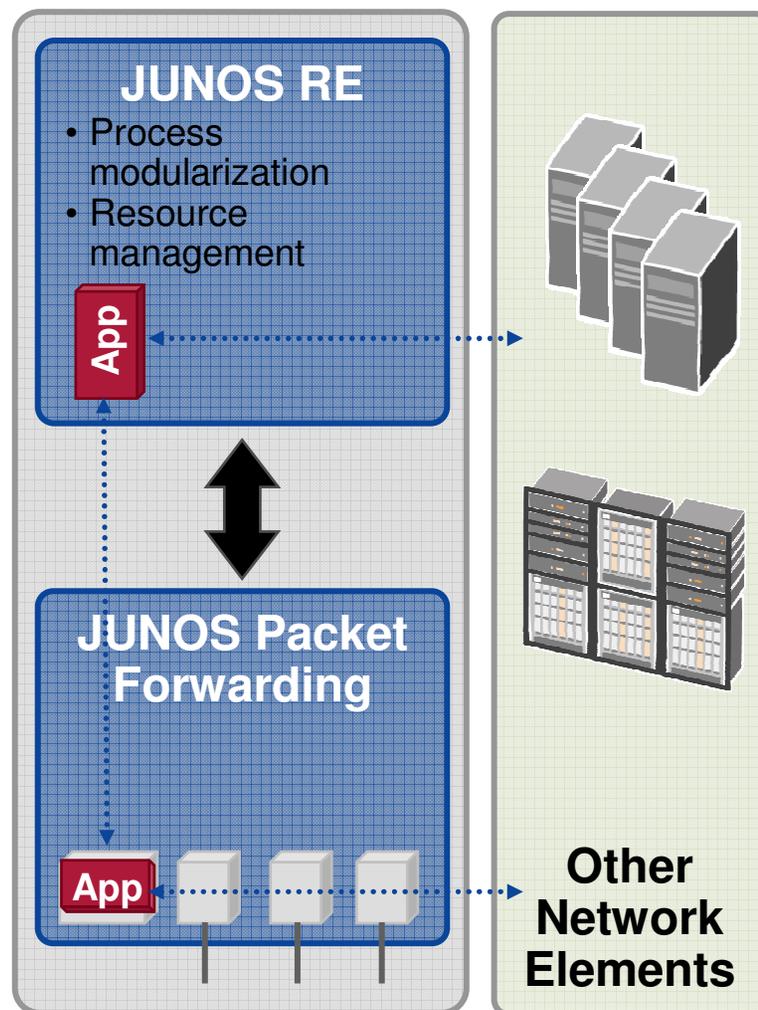
- Adapts applications to run in JUNOS
- Certificate used to sign apps
- Admin controls activated apps

## MultiService PIC SDK (MP-SDK)

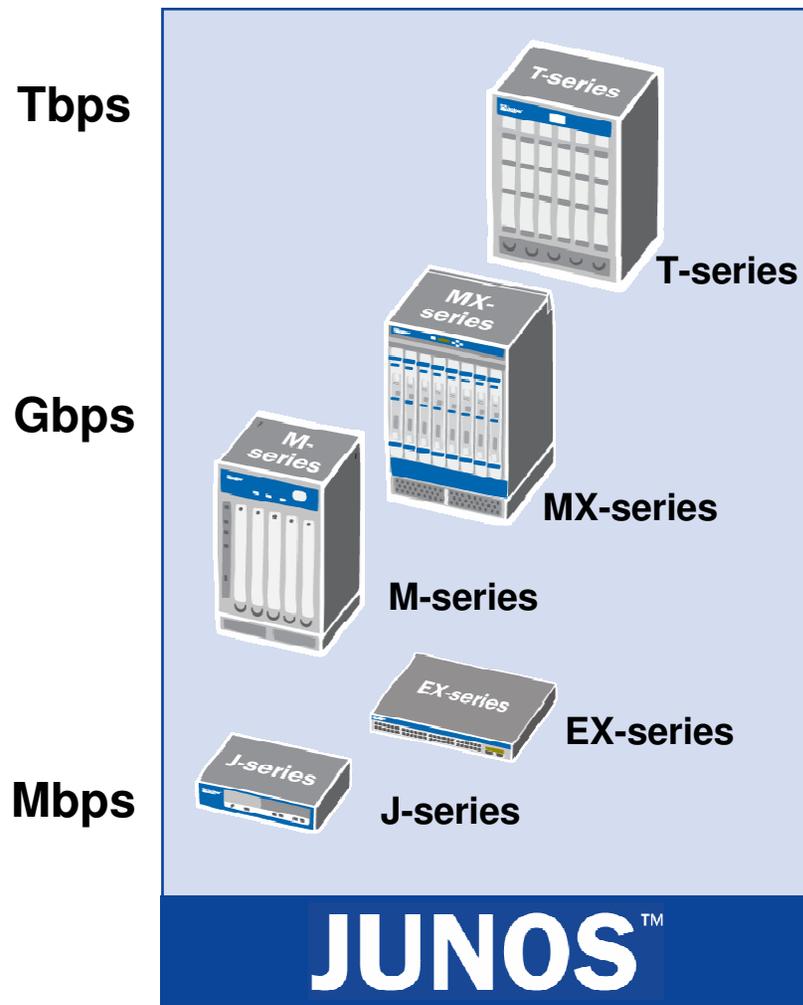
- Raw packet processing framework
- Very efficient and scalable



Partner Source Code



# Development Benefits of JUNOS Software



## ■ One Code Base

- Single implementation to build upon
- Mbps-Tbps platform range

## ■ One Release Line

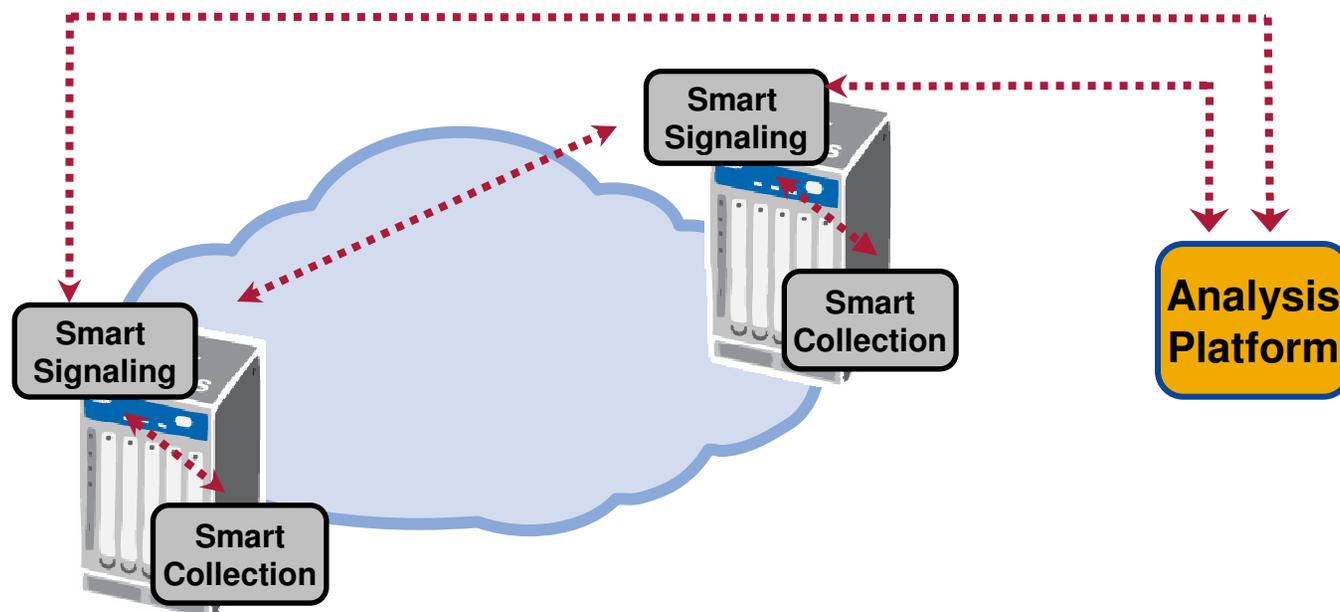
- Each release is a superset of prior
  - Readily adapted forward/backward compatibility
- Predictable schedule of development

## ■ One Modular Architecture

- Functional separation to protect base software *and* the PSDP applications
- Well-defined, intelligent interfaces to specific routing and services functions

## Applicability of PSDP for Traffic Analysis

- Develop specialized collector logic running on MS-PIC
- Develop optimized signaling protocol running on RE

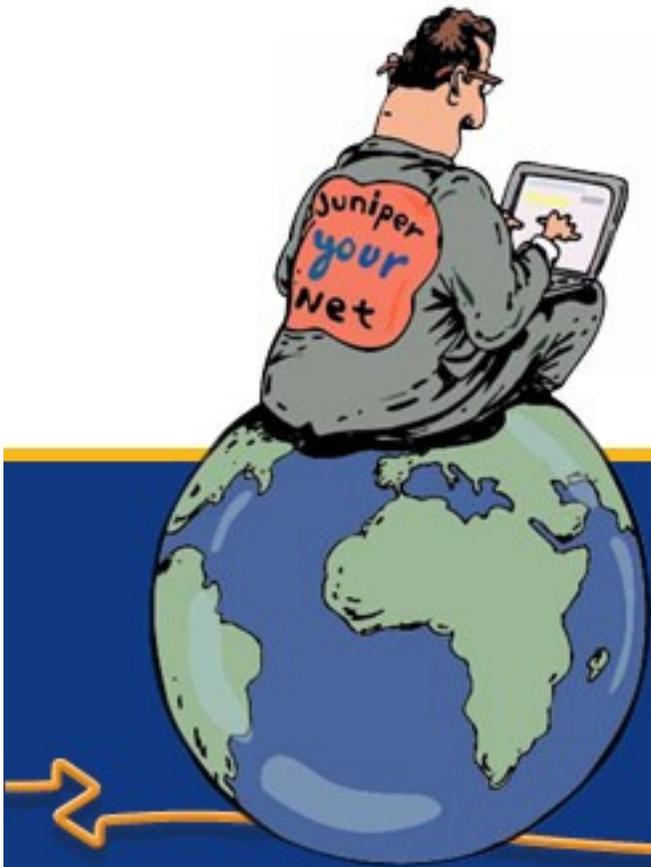


## Summary

- **JUNOS supports the relevant standards for traditional collection and analysis of traffic data**
- **Customers requiring more sophisticated mechanisms can now extend JUNOS' capabilities with their own developments**

## Questions? Comments?

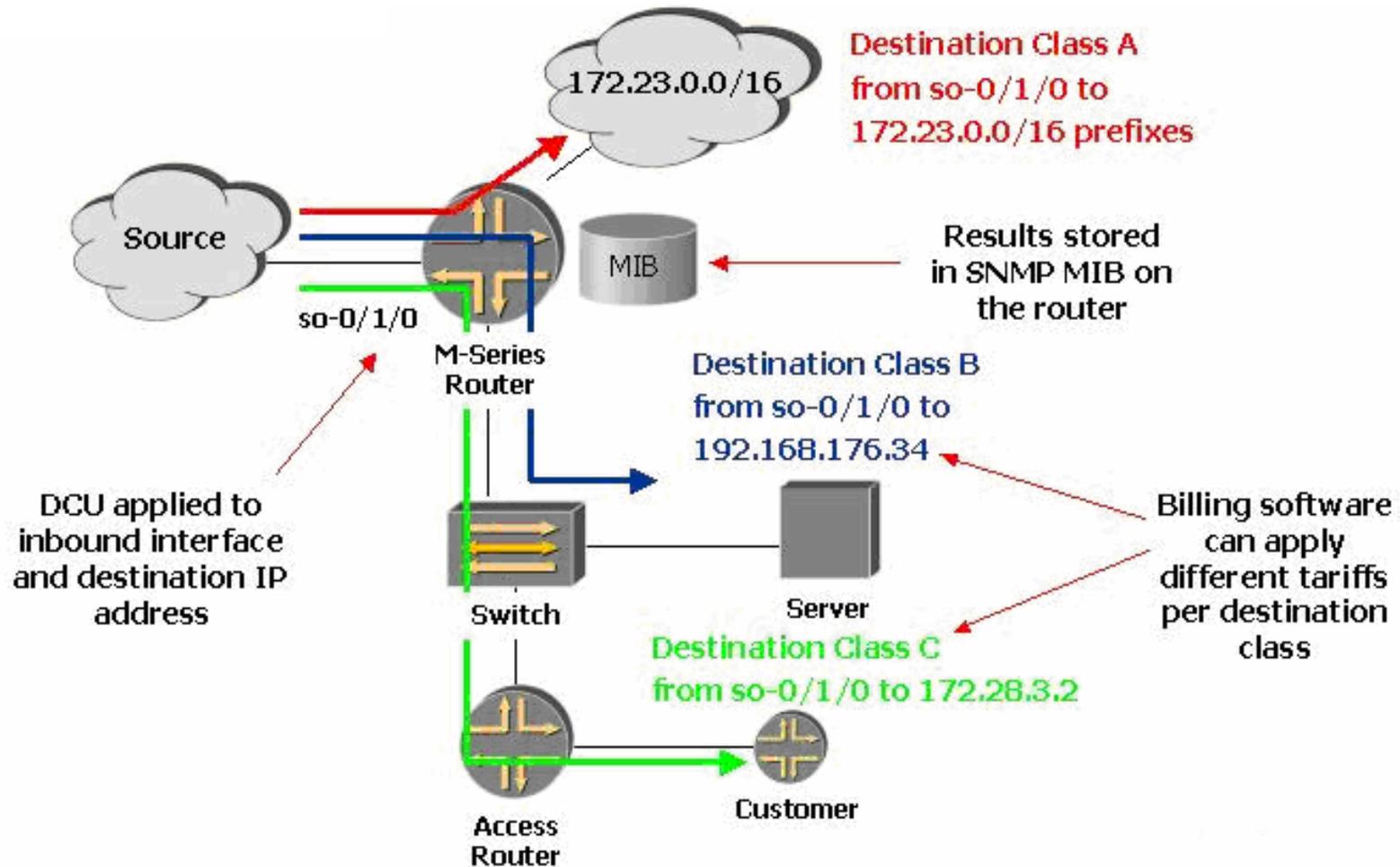
- **Can be now in French or English**
- **Or by email to [bdetroch@juniper.net](mailto:bdetroch@juniper.net)**



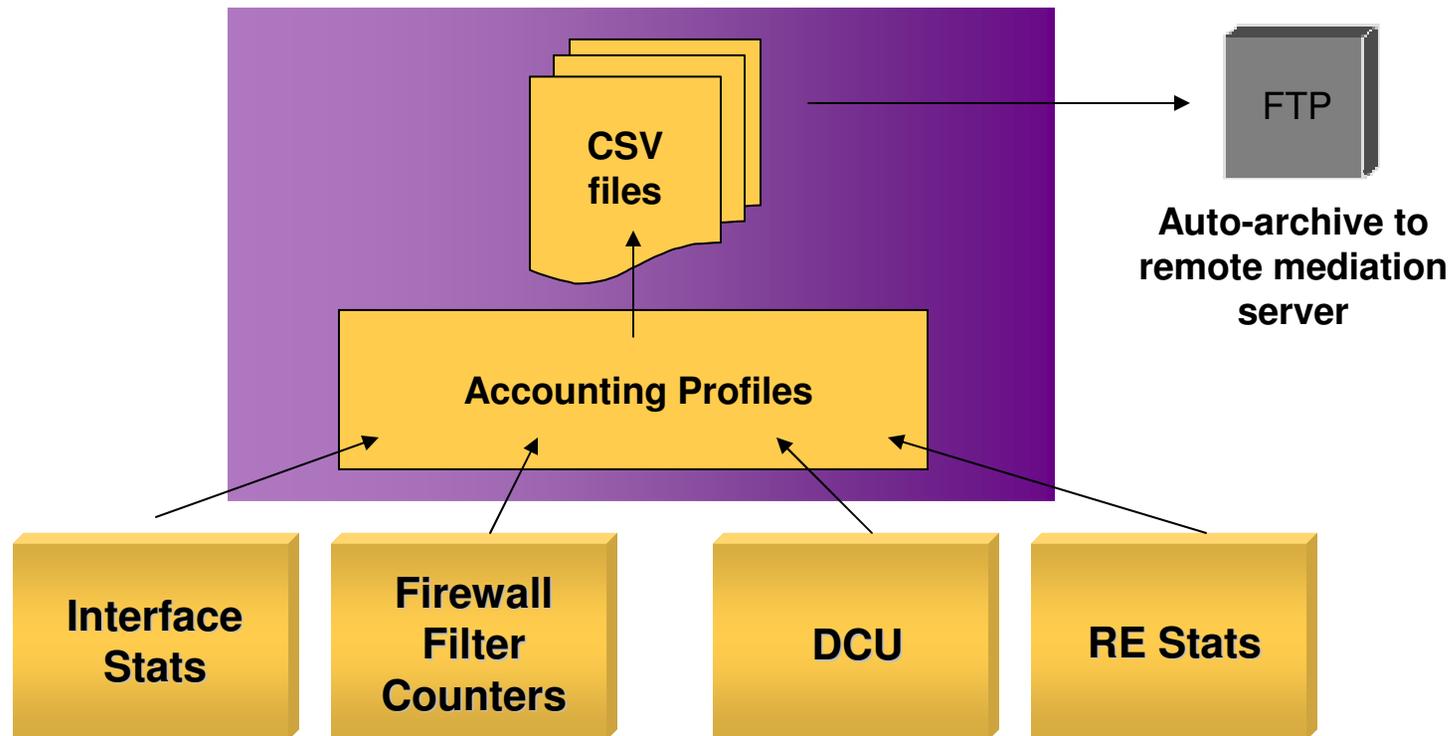
## Additional Details

- **SCU/DCU**
- **Accounting Profiles**
- **XML**
- **PSDP Development**

# SCU/DCU Details



# Accounting Profiles



- Reliable collection & transfer of billing data
  - Less CPU intensive than SNMP
  - Guaranteed delivery to mediation server

# XML – Information extraction

- CLI versus XML:

## Formatted ASCII format:

```
Physical interface: fxp0, Enabled, Physical link is Up  
Interface index: 4, SNMP ifIndex: 3
```

## XML-tagged version:

```
<interface>  
  <name>fxp0</name>  
  <admin-status>enabled</admin-status>  
  <operational-status>up</operational-status>  
  <index>4</index>  
  <snmp-index>3</snmp-index>  
</interface>
```

# The PSDP Build Process

