



SIGMA SYSTEMS
NEW SERVICES | DELIVERED.

Bandwidth Management | **Delivered.**

Sigma Systems' IPDR Collection Agent

Service Providers are facing new challenges in managing one of their scarcest resources – bandwidth. This daunting task is further compounded by the lack of tools to help identify who is using it, what is being used for, when it is being used and what action to take to minimize the impact on the network.

This lack of visibility is causing Service Providers to spend more capex and opex resources.

The IP Detail Record (IPDR) provides information about (IP)-based service usage and other activities that can be used by(OSS) and Business Support Systems (BSS).

IPDR is an evolving industry standard that enables Service Providers to begin to answer these questions and to begin using data collected to plan for consumption needs now and in the future.

Sigma's Solution

Sigma Active Mediation Platform (AMP) is based on a modular architecture, where functionality and processing capacity can seamlessly be added to over time. AMP provides a future-proof mediation infrastructure that promotes deployment of mediation solutions that scale dynamically with business requirements and volume.

AMP is a flexible, advanced, and convergent mediation system that supports any data exchange between any system in real-time (on-line or active mediation) or batch mode (off-line mediation). It provides maximum flexibility and enables service providers to quickly adapt to the ever-changing requirements and challenges of the communication industry.

Key Concepts:

Sigma AMP is an operational support system designed to adapt to each target environment and operator's specific requirements.

As a fully convergent system, it provides a component based architecture built around the following concepts:

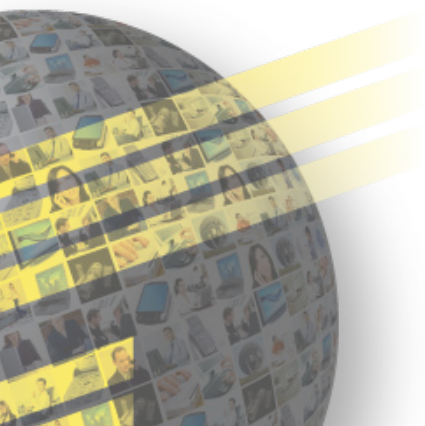
Extension Agents:

To speed implementation and seamlessly integrate into incumbent OSS/ BSS architectures, AMP supports network elements, switches from leading suppliers, industry standards and protocols including Nortel, Cisco, IPDR, GTP, Diameter, TCP, FTP and many others.

IPDR Agent:

Developed to address the needs of real-time collection of usage records from CMTSs, Sigma's IPDR collection agents enable Service Providers to deploy fast and efficient solutions for network usage, capacity planning and network rollout.

**From the Global Leader in
Advanced IP Service Fulfillment Solutions.**



Use Cases

Capacity Analysis & Service Modeling: With the introduction of a new product or service tier, or the anticipated growth of a popular offering, Service Providers must carefully assess what capacity resources will be required. The location and timing of capacity upgrades to support existing services, coupled with anticipated demand for capacity for new service, creates a complex capacity management challenge.

Fair Internet Usage: Service providers are grappling with the explosive growth in demand for network resources. This trend is driven by the availability of bandwidth-intensive applications that require higher levels of QoS for acceptable user experiences. Additionally, many operators face a situation in which a small number of power users are consuming ever larger volumes of network capacity and are using different protocols to get to content leading to network congestion. Service Providers must not discriminate against any protocols used by its users.

Sigma addresses these challenges by the use of Sigma AMP and the IPDR/SP collector to:

- IPDR Collection from the CMTSs to get usage data
- The System identifies when a disproportionate use of bandwidth is sustained by a single user(s)

What IPDR is:

- A more efficient and reliable mechanism for collecting specific types of network data from a DOCSIS CMTS
- A session-based streaming protocol that supports high-availability configurations and collector redundancy

Why IPDR

- New DOCSIS-based Service Models created need for Service Level visibility (PCMM, VOIP)
- IPDR Streaming Protocol (IPDR/SP) was introduced to provide reliable collection of Service Flow statistics
- Optimal for bulk data and event based data collection
- DOCSIS 3.0 enables Service Providers to more efficiently retrieve information via IPDR/SP

From Network to Service:

Traditionally, simple network management protocol (SNMP) provided most visibility into the cable network. Even though SNMP supports a rich network management model, its range of capability is limited in terms of scalability and reliability. As the name would suggest, SNMP was originally designed to support only network management practices and applications.

Evolution of DOCSIS:

The evolution of DOCSIS technology has introduced dynamic quality of service (QoS)-based offerings that expanded the edge management model from network-oriented to service-oriented. Furthermore, with new cable provider technologies and services such as wireless, tru2way, and advanced advertising, the relationship between service and network is no longer singular and static. Instead, there is a growing separation between service and network as providers define complex new services delivered over multiple network technologies

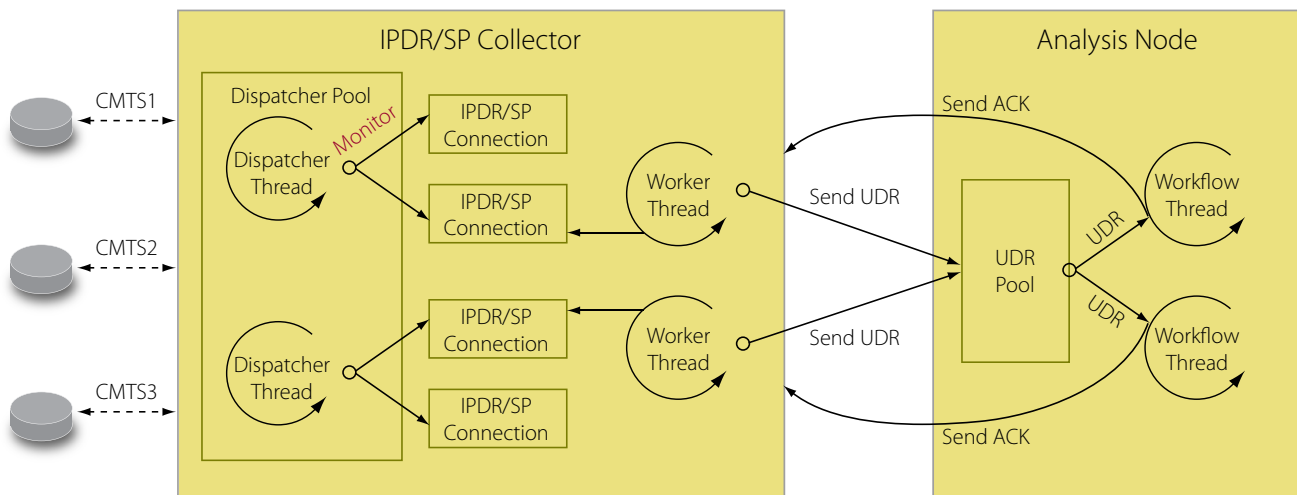


Figure 1 - Sigma IPDR Collector Architecture

Sigma IPDR Collector Architecture

Sigma's IPDR collector accepts from or connects to network elements using Java NIO (non-block IO) and creates IPDR/SP connection that implements the IPDR/SP protocol.

The dispatcher thread detects readiness (such as NE sends message to the collector) of an IPDR/SP connection and dispatch the connection to the work thread pool. A free worker thread will pick it and handle NE messages.

The worker thread handles the rendezvous between the Exporter (i.e., NE) and the collector as well as decoding IPDR DATA messages into Sigma AMP UDR format. The UDR is put into the UDR pool where Sigma AMP has control over the pool such as priority and classification based on UDR type.

A workflow thread then picks up the UDR and executes scripting code of the Analysis code. The workflow thread will run all the way to the end of workflow path.

High performance:

Sigma's IPDR collector is able to connect to hundreds or even thousands of CMTSs while collecting hundreds of thousands of IPDRs every 15 minutes per CMTS.

Scalable:

Sigma's IPDR collector is able to connect with thousands or even tens of thousands of IPDRs per hour from each CMTS.

Load balancing:

Sigma's IPDR collector facilitates an IPDR exporter to balance the load across multiple IPDR collection nodes to reduce the chance that the exporter has to drop records due to resource constraints.

Graphics Driven Process Modeling & Configuration:

AMP provides flexibility through configuration. Its high-level graphical design and operating environment delivers a complete set of configurable tools. to meet the challenging requirements of an operator or service provider.

IPDR Collecting Workflows:

IPDR XML – contains Cisco specific collector for IPDR/ XML records
IPDR/SP – contains standard IPDR/SP collector configured for Arris CMTS

Processing Workflows:

Unified workflow that processes UDR records including duplicate checks, validation and aggregation and then forwards records to data storage

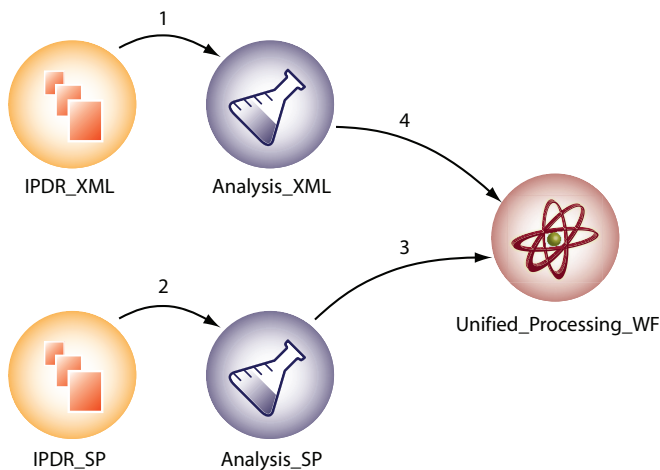


Figure 2

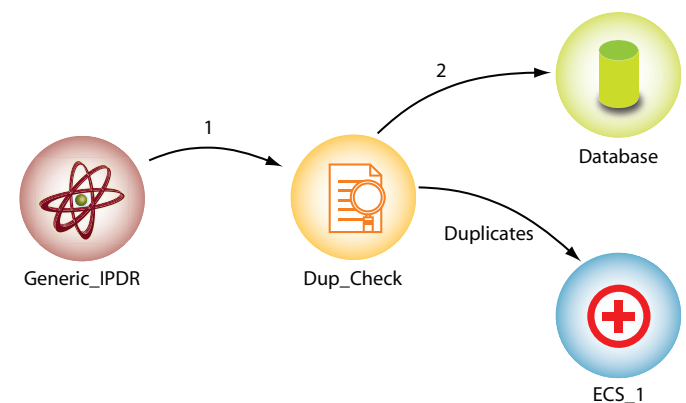


Figure 3

Discover what it means to deliver by contacting Sigma Systems today.

About Sigma Systems

Sigma Systems is the proven global leader in delivering advanced IP service fulfillment solutions. Sigma's powerful OSS software solutions enable the world's most innovative Communications Service Providers (CSPs) to deliver any service, over any access technology, to any device. The company's award winning, end-to-end service fulfillment solutions include products for the creation, ordering, activation, and management of individual, bundled, and converged services which incorporate voice, video, high speed internet, and mobile services.

Sigma's heritage includes over 12 years of proven solution delivery experience in multi-service, multi-technology operating environments. Today, Sigma manages nearly 50 deployments and has delivered over 100 million services for communications service providers worldwide.

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