Agenda

o Network Fingerprinting

o Data Collection and Templates

o Applying Enrichment

o AI Model Use Cases

o Proactive Network Management

o Wrap Up

Network Fingerprinting

- What is Network Fingerprinting?
- Classification
- Flexible
- Inexpensive
- Accessible

Network Systems

Data Templates
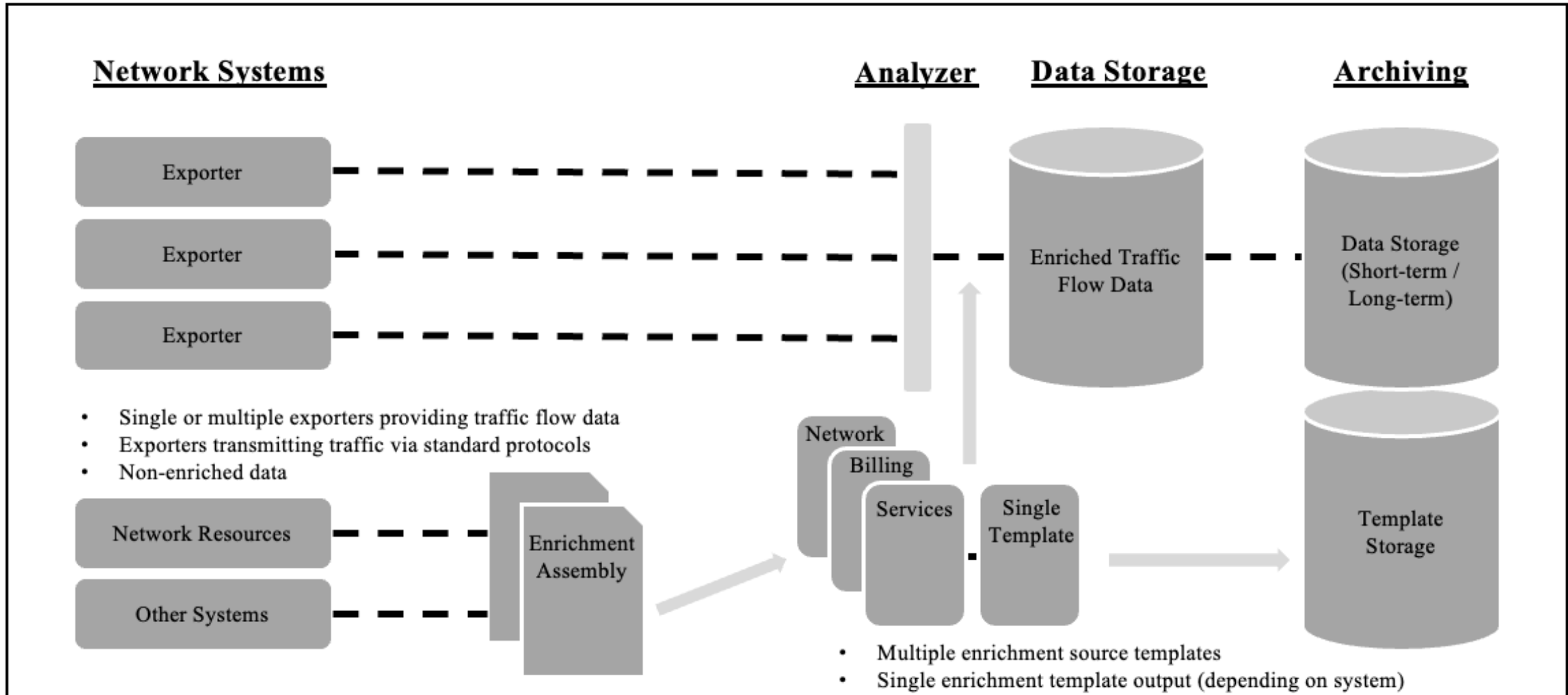
- Router Flow Data
- Data Fields
- Collection
- Rationalizing Data
- Storage

o Sampling

o Refinement

o Continuous

o Aggregation

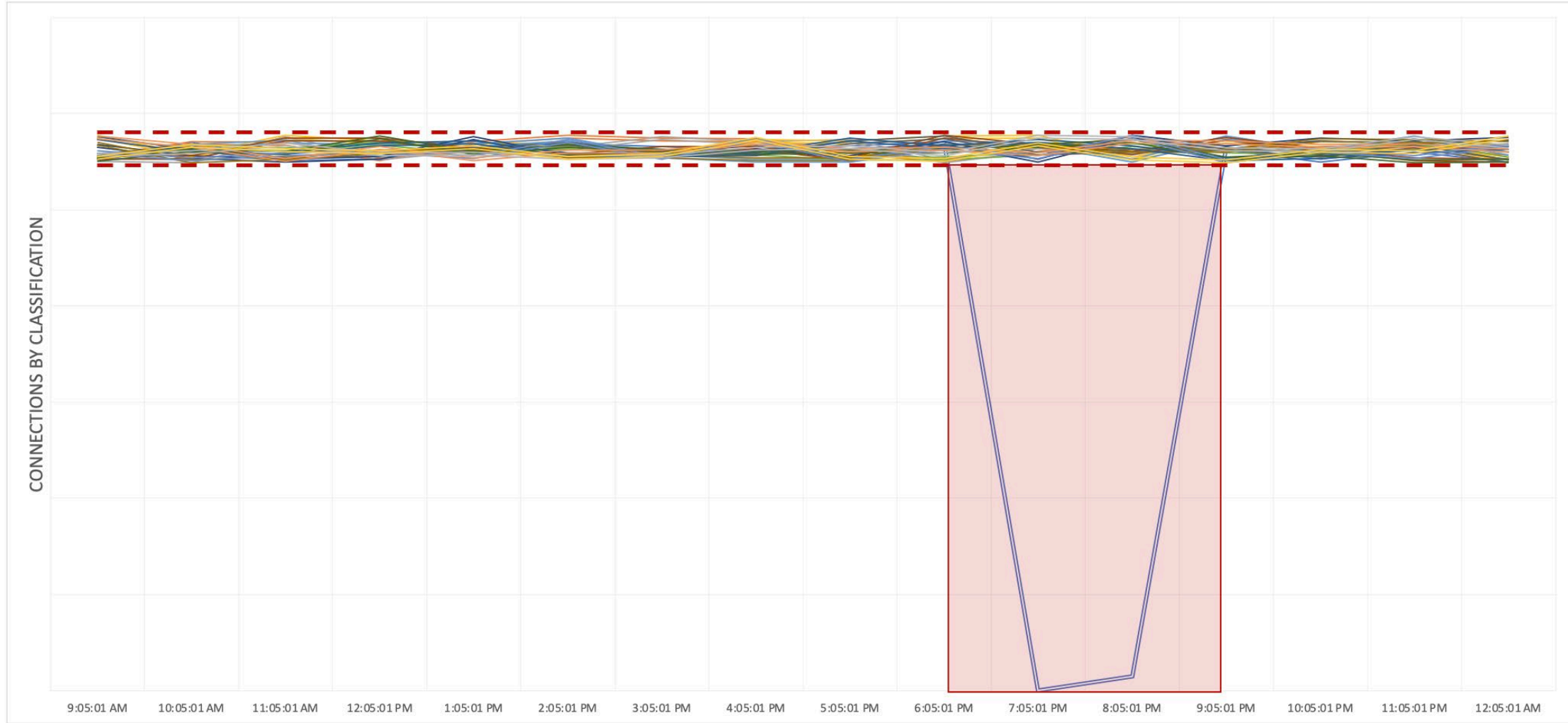| Archive Description	Archive Timeframe	Storage Conditions	Storage Class	Details
Autonomous Systems	On Update	Past two versions	Standard / Short-term	Two versions of the complete source stored
Application Identification	Daily	7 days	Standard / Short-term	Saved daily and stored for 7 days
Billing System	On Update	Past two versions	Standard / Short-term	Two versions of the complete source stored

Applying Enrichment

Flow Record Field

Enrichment Source Fields derived from Client IP and Destination IP Addresses

client.ip	client.publicip	client.mac	client.package	client.monthusage	client.networkelement	org.name	application
10.0.0.1	192.168.0.1	00:00:00:00	GIGABIT PLUS - 1G	1.10 TB	CMTS-A01	MICROSOFT-CORP-MSN-AS-BLOCK	MS-Teams-Skype
10.0.0.2	192.168.0.1	00:00:00:00	GIGABIT PLUS - 1G	389.12 GB	CMTS-C01	MICROSOFT-CORP-MSN-AS-BLOCK	MS-Teams-Skype
10.0.0.3	192.168.0.1	00:00:00:00	750 MB PREMIER	753.24 GB	CMTS-G01	FASTLY	Disney Plus
10.0.0.4	192.168.0.1	00:00:00:00	500 MB Starter	1.34 TB	CMTS-A02	FASTLY	Disney Plus
10.0.0.5	192.168.0.1	00:00:00:00	GIGABIT PLUS - 1G	2.37 TB	CMTS-B01	FASTLY	Disney Plus

o Data Discovery

o AI Models

o Use Case Examples

    o Anomaly Detection

    o Capacity Planning

    o Customer Churn

Anomaly Detection

Streaming Services	9:05:01 AM	10:05:01 AM	11:05:01 AM	12:05:01 PM	1:05:01 PM	2:05:01 PM	3:05:01 PM	4:05:01 PM	5:05:01 PM	6:05:01 PM	7:05:01 PM	8:05:01 PM	9:05:01 PM	10:05:01 PM	11:05:01 PM	12:05:01 AM
	1,410.49	1,503.14	1,456.73	1,551.59	1,416.94	1,344.31	1,481.84	1,290.20	1,331.72	1,337.22	1,238.44	1,684.45	1,783.56	1,864.42	1,845.42	1,798.37

Future / Forecast Values
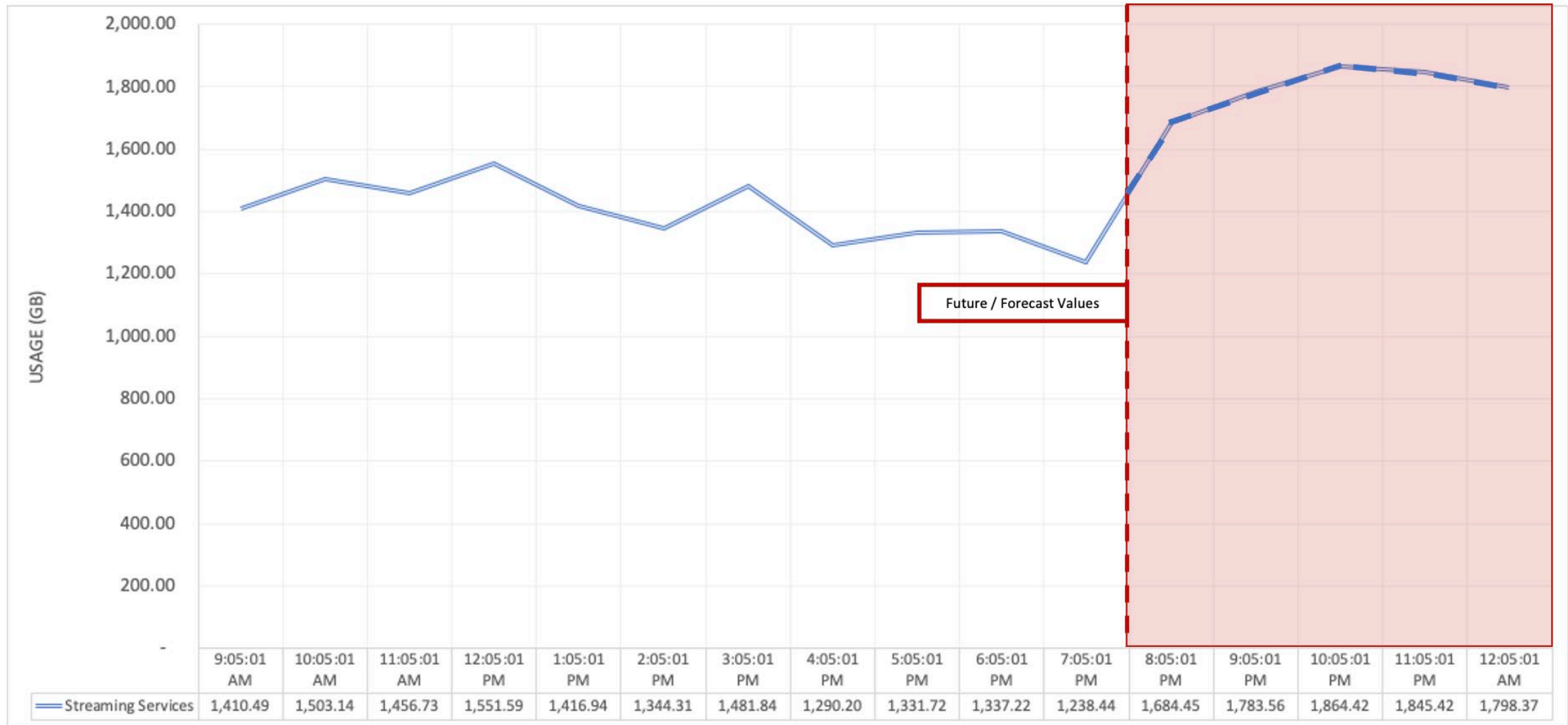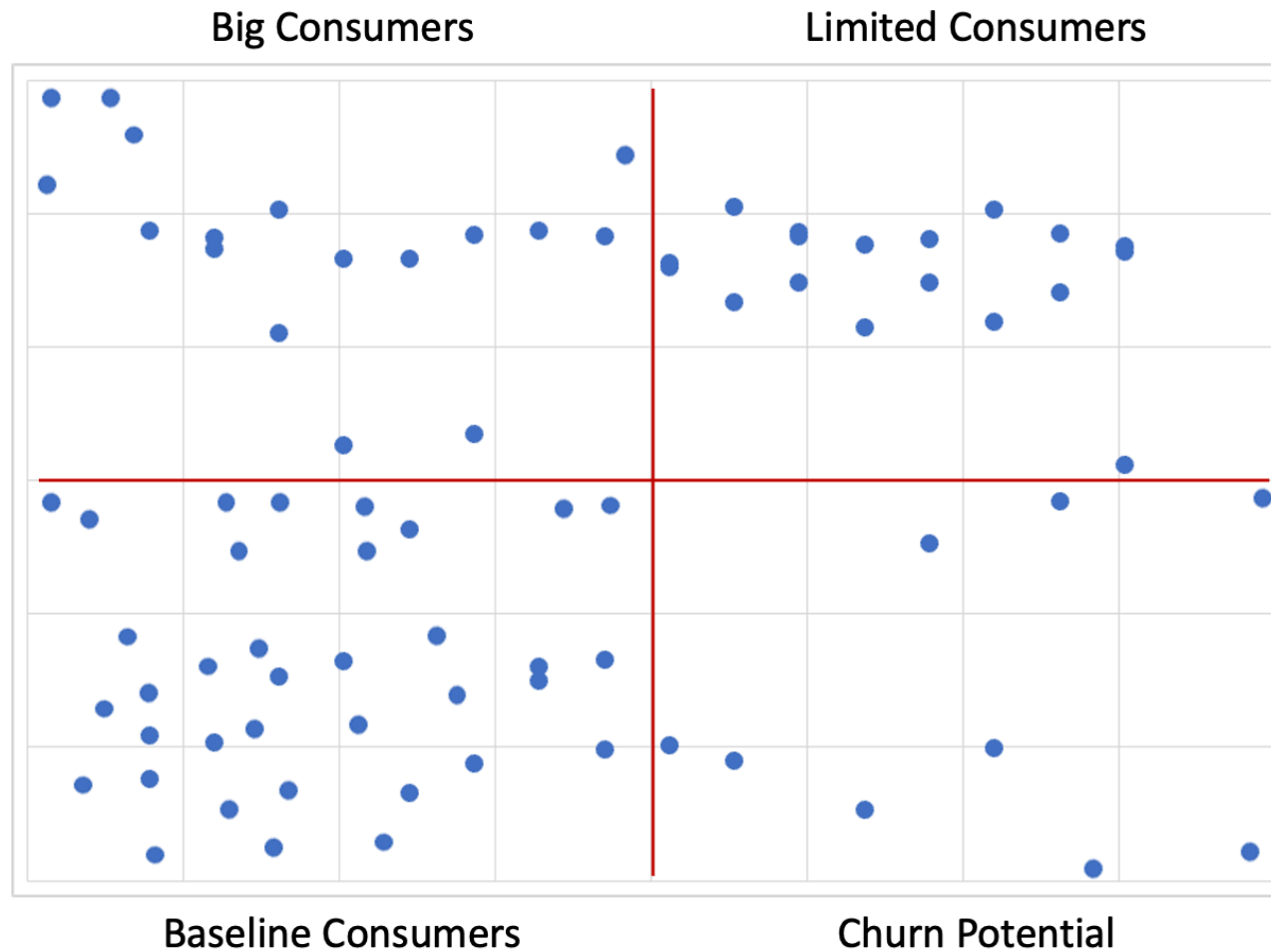
- **Big Consumers:** Power-users, routinely outside of assigned package
- **Baseline Consumers:** Consistent and expected activity based on assigned package
- **Limited Consumers:** Consistently below baseline activity of assigned package
- **Churn Potential:** Measurable decrease in activity, increased speed test usage and/or increased support interaction

Proactive Network Management

o Monitoring and Alerting

o Automation and Self-Healing

o Network Health Grading

o Quality of Experience

o Resource Planning

Monitoring and Automation

Use Case	Example Enrichment Dependency
Internal network capacity utilization (caches)	Internal network resources
Outage condition detection based on traffic and usage	Usage data, billing, IPDR
Outage detection for popular services / systems	Autonomous systems
Primetime or peak hour monitors	Applications
Congestion and network bottleneck visibility	Usage data, billing, IPDR
Top client / server monitors	Autonomous systems, Applications
Application and service optimization	Autonomous systems, Applications
Threat conditions and malicious traffic detection	Threat and security systems

Network Scoring

Client	Anomaly Impact	Anomaly Score	Peak Utilization	Network Score	Service Interactions	Service Score	Total
10.0.0.1	2.06 hours	0	93%	0	0	1	1
10.0.0.2	0 hours	1	71%	1	0	1	3
10.0.0.3	0 hours	1	68%	1	1	0	2

* Last 30 Days of Data

o Improved Customer Experience

o Comprehensive

o Adaptable

o Proactive Network Management

o Broadband Usage Evolution

Creating Infinite Possibilities.

Thank You!

John Mansor

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