

DX Operational Intelligence 21.3.1

What's New



Shifting from Monitoring to Observability

Monitoring

Observability

Collection of Data



Connections in Data

Individual Component Status



End-to-End Digital Service Health

KeepThe Lights On



Prioritizing Against Business Impact

“ How do I monitor the **health and performance** of infrastructure and applications in a way that meaningfully considers **user experience** and other critical **business objectives**?”

Gartner, *Solution Path for Modern Infrastructure and Application Monitoring*, 30 November 2020, Gregg Siegfried and Venkat Rayapudi, ID: G00720254

Your Journey Toward Zero Touch Assurance

Close yet?



Are you there?



Are you here?



The AIOps Platform from Broadcom

Digital Experience Monitoring

Glassbox	dynatrace
BROADCOM	catchpoint

Application Monitoring

BROADCOM	New Relic
dynatrace	APPDYNAMICS

Infrastructure Monitoring

BROADCOM	splunk
DATADOG	Microsoft System Center Operations Manager

Network Monitoring

solarwinds	splunk
BROADCOM	NETSCOUT

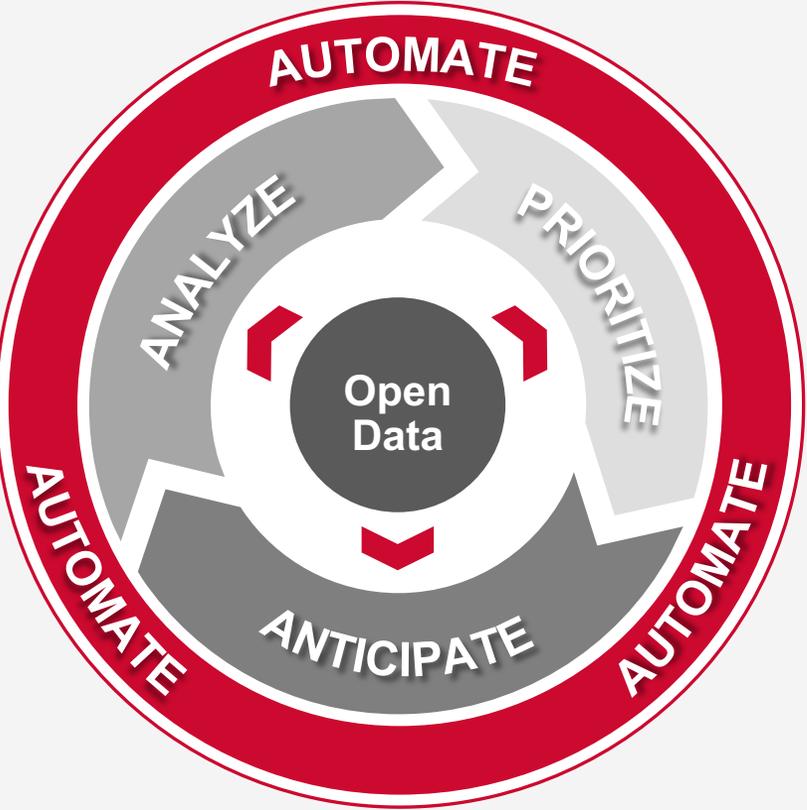
Mainframe Monitoring

BROADCOM

+ Other 3rd party tools

(Machine Data: Metrics, Alarms, Topology, Logs, Text & Wire Data)

DX Operational Intelligence



Open | Extensible | Hybrid

Root Cause Analysis
Unified Visibility
Collaboration and Planning



Remediation Workflows

ITSM

DX Operational Intelligence

Smarter IT Operations Through Actionable Insight

Root Cause Analysis

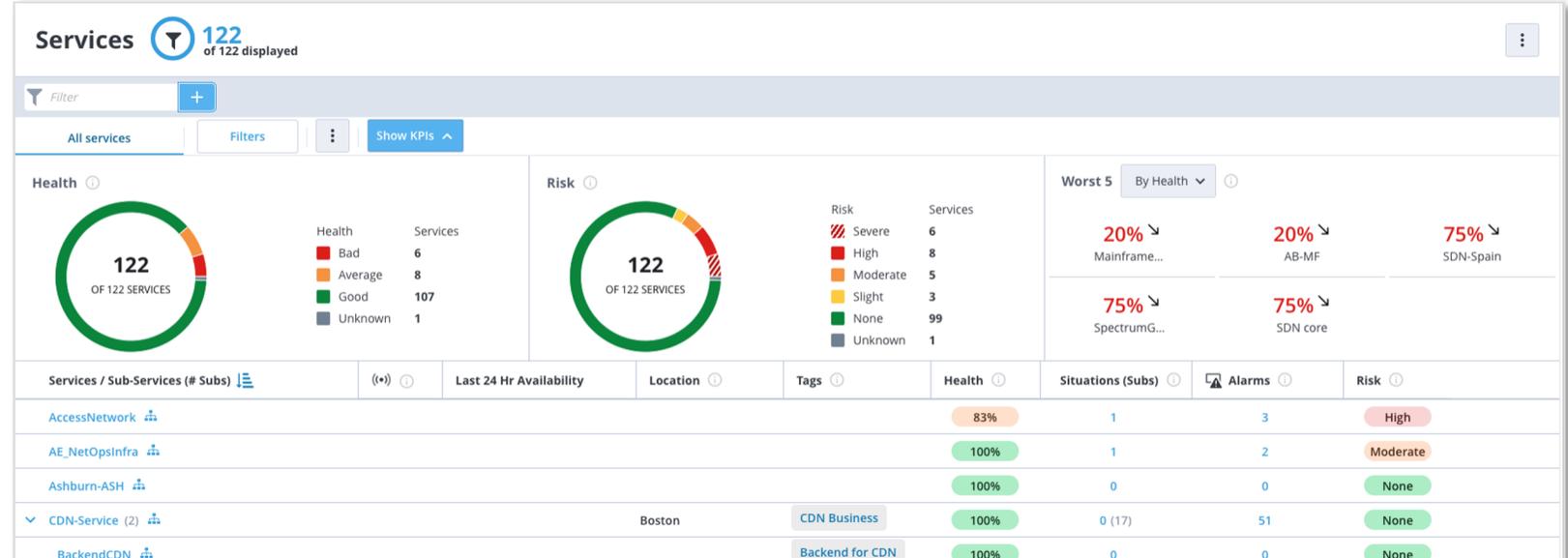
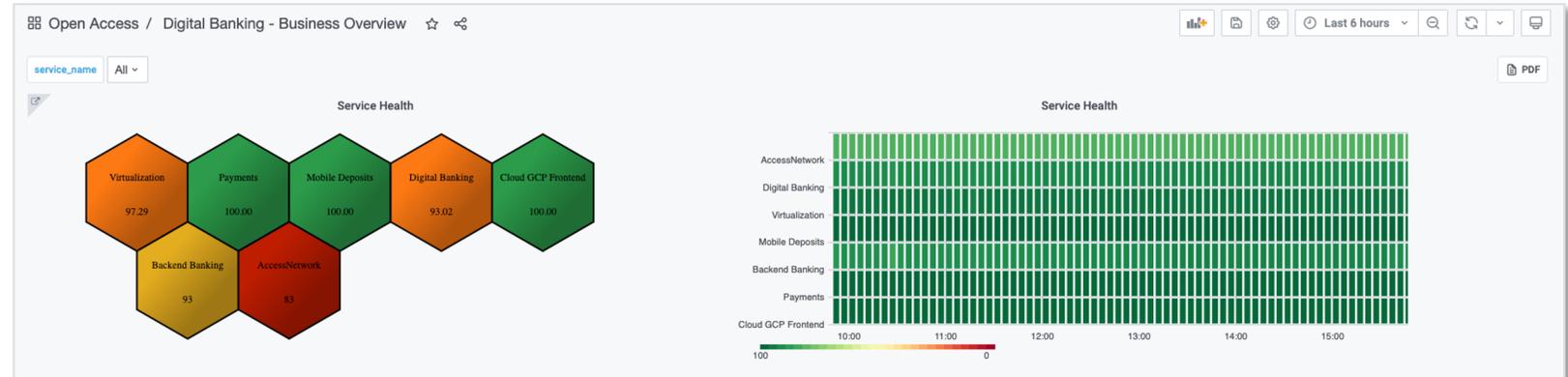
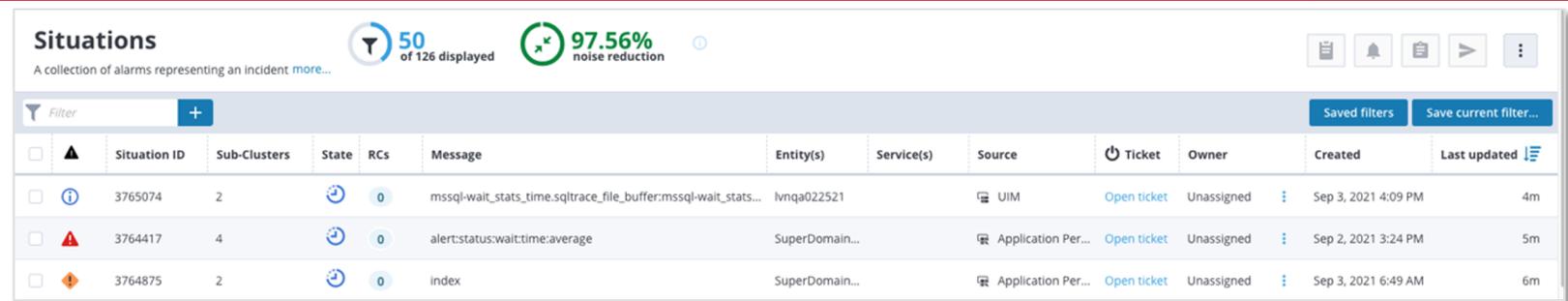
- Alarm Noise Reduction
- Alarm Management
- ITSM Ticketing
- Intelligent Remediation

Unified Visibility

- Tools and Data Consolidation
- Dashboarding
- Reporting
- Single Pane of Glass

Collaboration and Planning

- Capacity Planning and Forecasts
- Inventory Monitoring
- Cross Domain Observability
- Service Assurance





<input type="checkbox"/>		Situation clusters	Message	Entity(s)	Service(s)	Source	Ticket	Owner	Created	Last updated
<input type="checkbox"/>		ID:3765019:0	The alert z/OS Alerts Status has breached the CRITICAL ...	SuperDomain...		Application Per...	Open ticket	Unassigned	Sep 3, 2021 3:45 PM	1h 19m

Alarm Details

Alarm ID	669802.dxi-na1.saas.broadcom.com-31e814f1-b722-417c-a97d-9ea993693807-MVSDE25
Alarm type	Application
Alarm message	The alert z/OS Alerts Status has breached the CRITICAL threshold of 3
Time since last update	an hour

Monitoring Details

Group	
Metric	SuperDomain MVSDE25 Cross-Enterprise APM Process Cross-Enterprise APM Agent z/OS Metrics Alerts J...

Owner Details

Assigned To	
Acknowledged	
Recommended automation actions (Confidence)	
List Files Workflow	73%
+ Policy	

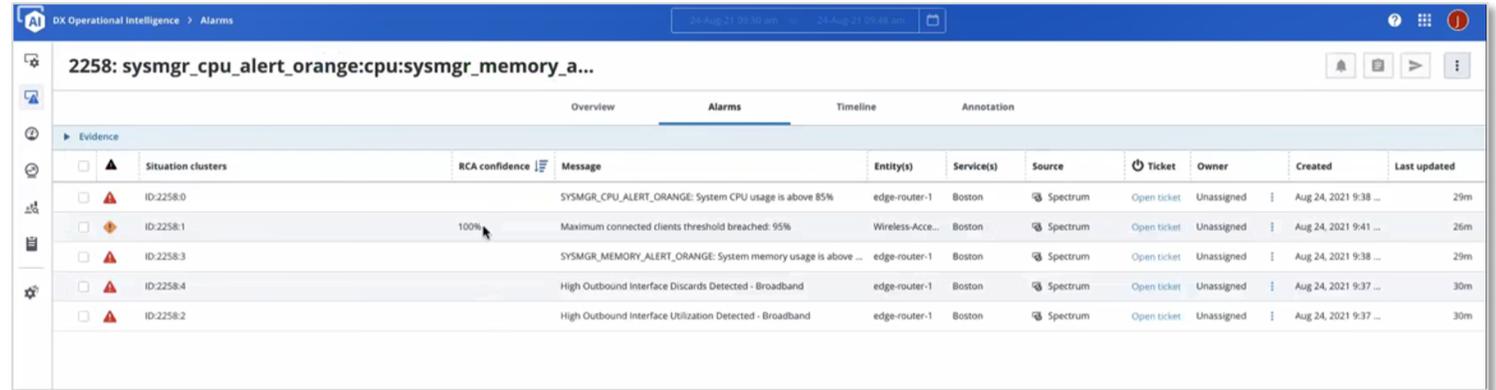
Identify and Address Problems Faster



Leverage Situations to Start with the Right Alarm

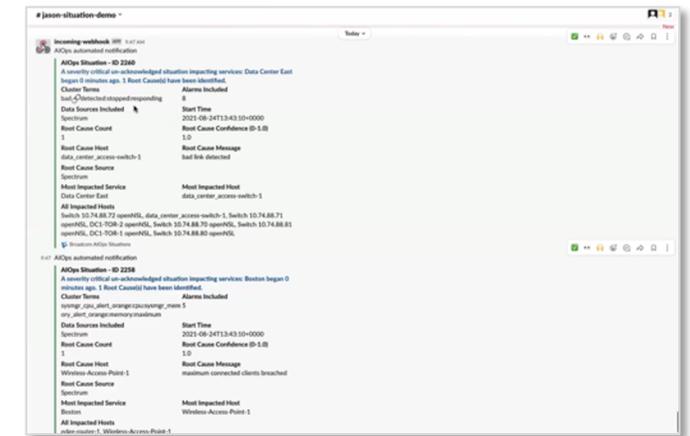
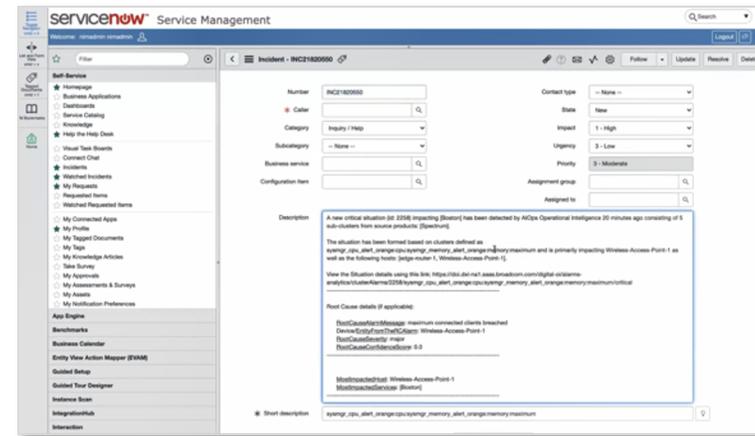
- Situations based on configurable Text, Time, Service and Host dimensions
- Network based root cause from DX NetOps root cause analysis
- Filter using Situations and alarm attributes
- Actions supported to open ticket, send a notification, add annotations, assign to troubleshooter and acknowledge or close
- [APIs](#) to configure and trigger programmatically

Alarm Correlation and Probabilistic Root Cause



2258: sysmgr_cpu_alert_orange:cpu:sysmgr_memory_a...										
Evidence			Overview	Alarms	Timeline	Annotation				
	Situation clusters	RCA confidence	Message	Entity(s)	Service(s)	Source	Ticket	Owner	Created	Last updated
<input type="checkbox"/>	ID:2258:0		SYSMGR_CPU_ALERT_ORANGE: System CPU usage is above 85%	edge-router-1	Boston	Spectrum	Open ticket	Unassigned	Aug 24, 2021 9:38 ...	29m
<input type="checkbox"/>	ID:2258:1	100%	Maximum connected clients threshold breached: 95%	Wireless-Ac...	Boston	Spectrum	Open ticket	Unassigned	Aug 24, 2021 9:41 ...	26m
<input type="checkbox"/>	ID:2258:3		SYSMGR_MEMORY_ALERT_ORANGE: System memory usage is above ...	edge-router-1	Boston	Spectrum	Open ticket	Unassigned	Aug 24, 2021 9:38 ...	29m
<input type="checkbox"/>	ID:2258:4		High Outbound Interface Discards Detected - Broadband	edge-router-1	Boston	Spectrum	Open ticket	Unassigned	Aug 24, 2021 9:37 ...	30m
<input type="checkbox"/>	ID:2258:2		High Outbound Interface Utilization Detected - Broadband	edge-router-1	Boston	Spectrum	Open ticket	Unassigned	Aug 24, 2021 9:37 ...	30m

Actions through UI or API



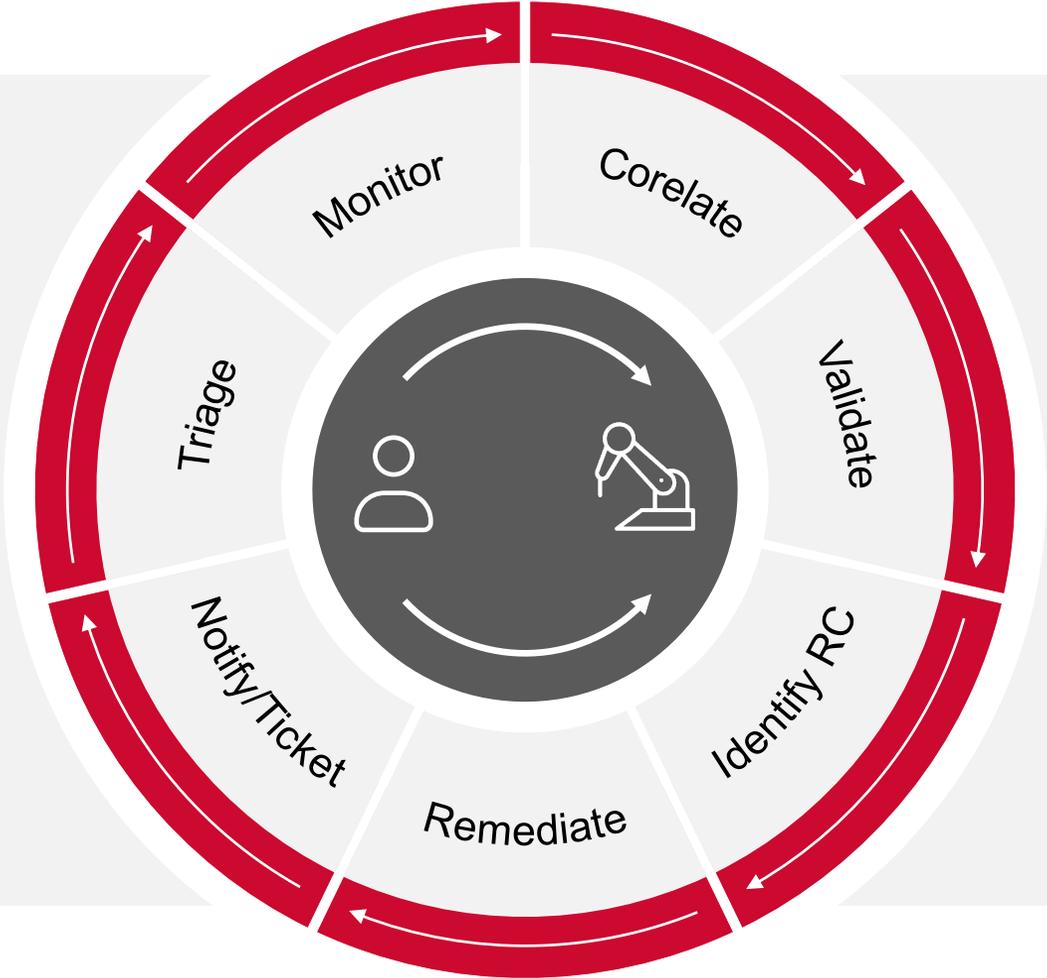
Ticketing & Triage Model

Traditional Ops vs AIOps



TRADITIONAL OPERATIONS

- Manual Process
- Error Prone
- Costly
- Repetitive
- Time-intensive

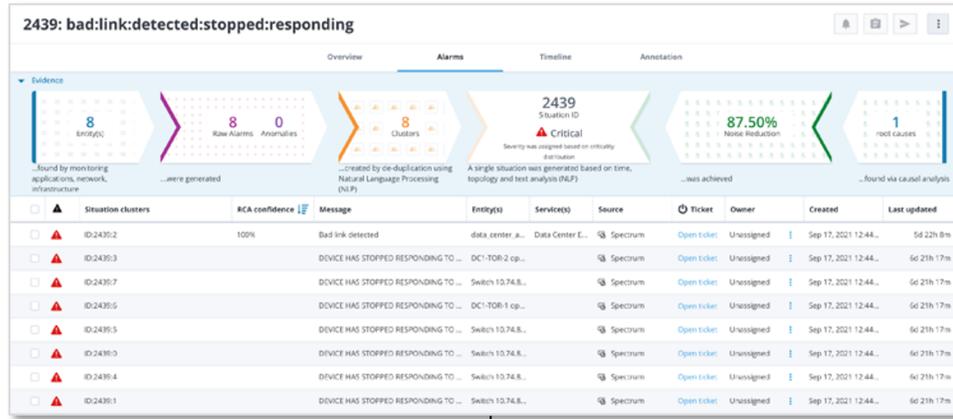


DX OPERATIONAL INTELLIGENCE

- Automated Processes
- Consistent And Continual
- Reduces Operator Load
- Improves Accuracy and Efficiency
- Reduces Costs & MTTR

Flexible ITSM and Notification Rules

- Select filter attribute...
- Alarms Count
- Closure Ts
- Custom1
- Custom2
- Hosts
- Is Closed
- Is Orphan
- Message
- Noisy
- RootCause Count
- Service
- Severity
- Situation Id
- Source
- Start Time
- State
- Status
- SubClusters Count
- Timestamp
- Most Impacted Host
- Most Impacted Service
- Noisy
- Primary Root Cause Host
- Primary Root Cause Service
- Primary Root Cause
- Source
- Root Cause Count
- Root Cause Message
- Root Cause Relative Confidence



Policy

Policy Name *

Create notifications for:

Notifications will be generated for the selected Alarm Type. Please note that in case of All Alarm, user can update the filter criteria with desired Alarm Type(s)

Service Alarm
 Rootcause Alarm
 All Alarm
 Situation

Build a policy to be triggered when filters defined below are met

Filter + All Queues CLEAR ALL

Alarm Type: SituationCluster Is Stable: true

- Generic Webhook
- Slack
- Email
- ServiceNow

incoming-webhook APP 9:58 AM
AIOps automated notification

AIOps Situation - ID 2439
A severity critical un-acknowledged situation impacting services: Data Center East began 30 minutes ago. 1 Root Cause(s) have been identified.

Cluster Terms bad:link:detected:stopped:responding	Alarms Included 8
Data Sources Included Spectrum	Start Time 2021-09-17T16:45:18+0000
Root Cause Count 1	Root Cause Confidence (0-1.0) 1.0
Root Cause Host data_center_access-switch-1	Root Cause Message bad link detected
Root Cause Source Spectrum	Most Impacted Host data_center_access-switch-1
Most Impacted Service Data Center East	All Impacted Hosts Switch 10.74.88.72 openNSL, data_center_access-switch-1, Switch 10.74.88.71 openNSL, DC1-TOR-2 openNSL, Switch 10.74.88.70 openNSL, Switch 10.74.88.81 openNSL, DC1-TOR-1 openNSL, Switch 10.74.88.80 openNSL

Broadcom AIOps Situations

Number: INC21912606 Contact type: -- None --

* Caller: quser quser State: New

Category: Inquiry / Help Impact: 1 - High

Subcategory: -- None -- Urgency: 3 - Low

Business service: Priority: 3 - Moderate

Configuration item: Assignment group: Network Assigned to: chendra1 shekar1

Description: A new critical situation (id: 2439) impacting [Data Center East] has been detected by AIOps Operational Intelligence 30 minutes ago consisting of 8 sub-clusters from source products: [Spectrum].

The situation has been formed based on clusters defined as bad:link:detected:stopped:responding and is primarily impacting data_center_access-switch-1 as well as the following hosts: [Switch 10.74.88.72 openNSL, data_center_access-switch-1, Switch 10.74.88.71 openNSL, DC1-TOR-2 openNSL, Switch 10.74.88.70 openNSL, Switch 10.74.88.81 openNSL, DC1-TOR-1 openNSL, Switch 10.74.88.80 openNSL].

View the Situation details using this link: <https://doi.dxi-na1.saas.broadcom.com/digital-oi/alerts-analytics/clusterAlerts/2439/bad%3alink%3Adetected%3Astopped%3Aresponding/critical>

Root Cause details (if applicable):

RootCauseAlarmMessage: bad link detected
Device/EntityFromTheRCAAlarm: data_center_access-switch-1
RootCauseSeverity: critical
RootCauseConfidenceScore: 1.0

MostImpactedHost: data_center_access-switch-1
MostImpactedServices: [Data Center East]

Identify Performance Issues with Anomaly Detection

- Improved anomaly detection algorithm to reduce false positives
- Increased scale handled – upto 5M metrics per tenant
- Intuitive configuration for metrics to be enabled for anomaly detection
- Configurable alarms for identified anomalies

The screenshot displays the 'DX Operational Intelligence > Settings' interface. The main panel is titled 'APM Avg Reponse Time' and shows a configuration for 'Product name' (Application Perfo...) and a filter for 'Metric: Response Time (ms) (Ends with)'. A table lists several 'Average Response Time (ms)' metrics from 'SuperDomain | Custom Metric Host (Virtual) | Cust...'. A 'Delete' button is visible at the bottom left of the table.

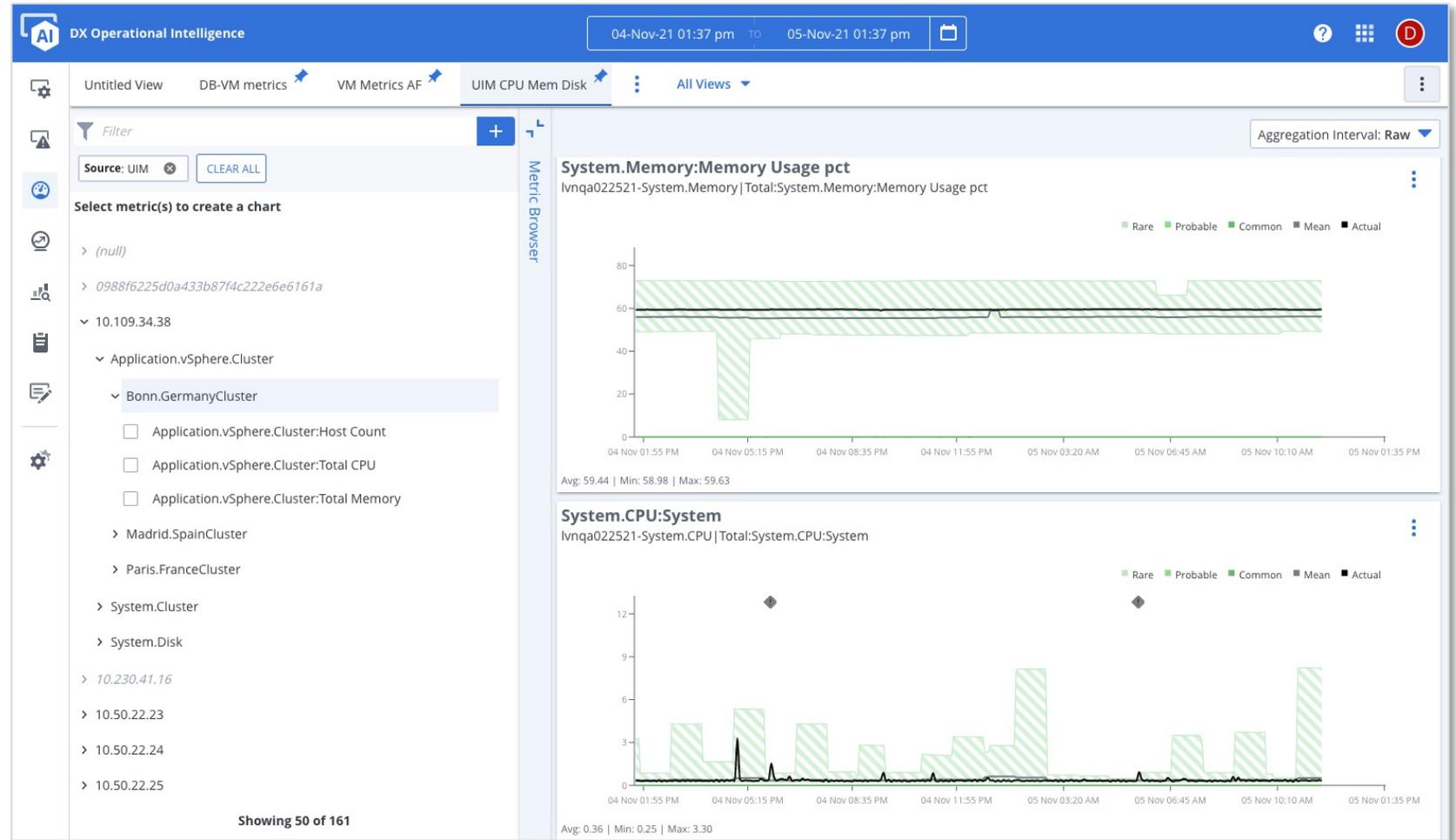
The 'Configure Alarms' dialog box is open on the right, with the following settings:

- Setup Anomaly Alarms**
- Enable Detection
- Use System Settings
- Alarm**
- Alarm when anomaly is**
 - Above threshold Below threshold
- Alarm if anomaly**
 - Count over threshold is 5 in 6 occurrences
- Alarm Message**

```
`${metric_name}` has breached threshold for  
`${countOverThreshold}` out of `${observationCount}` times for  
`${host}`
```
- Select Alarm Notification Policy**
 - Choose an Alarm Notification Policy...
 - Can't find? [Create New](#)
- Buttons: **Cancel** and **Done**

Performance Analytics for Deep Dive Triage

- Cross domain performance metrics visualization for analysis and saved views for future references or evidence in a triage cycle
- Near real time data to stay on top of any performance issues in the monitored environment
- Intuitive filters on entity or metric to narrow down the analysis



Monitored Inventory for Consolidated View of Monitored Environment Across Domains

- Near real time updates for the correlated monitored elements across the monitored environment
- Contextual information and workflows for operators to view alarms, performance metrics, services impacted and capacity projections from a single view
- Filters to identify a critical device or entities belonging to a service or entities in maintenance, etc.
- Manage maintenance windows in context of an entity, a service or a group of devices

The screenshot displays the 'Monitored Inventory' interface in the Broadcom DX Operational Intelligence v21.2 application. The main view shows a table of monitored entities with columns for Entity, Path to CI, IP Address, and Source. A filter is applied for 'State: Critical' and 'Services: Banking (Contains)'. A detailed view for the entity 'apollo.acme.com' is shown, displaying various attributes such as Aliases, Role, IP Addresses, MAC Addresses, Operating System, and Hardware Details. Below the details, there is a section for 'Alarms' showing recent alerts. A 'Set a Maintenance Window' dialog is open, allowing users to define a maintenance window for the selected entity, including start and end times, time zone, and repeat options.

Entity	Path to CI	IP Address	Source
apollo.acme.com	AS_acme.com / acme.com-prod / KB-clus...	10.241.249.181	DX App...
zeus.acme.com	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.44	DX Net...
athena.acme.com	WS_acme.com / acme.com-prod / KB-clus...	138.42.229.41	DX App...
jupiter.acme.com	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.105	DX Net...
vulcan.acme.com	EBS-1 / VM-1 / EC2 / Zone-1 / US East / A...	138.42.229.103	DX App...
hera.acme.com	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.103	DX App...
aphrodite.acme...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.45	DX App...
bacchus.acme.c...	EBS-1 / VM-1 / EC2 / Zone-1 / US East / A...	10.241.249.184	DX App...
dionysus.acme...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.101	DX Infra...
ceres.acme.com	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.107	2 sources
demeter.acme...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.102	DX Net...
venus.acme.com	WS_acme.com / acme.com-prod / KB-clus...	138.42.229.100	DX Net...
artemis.acme.c...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.40	DX Net...
hephaestus.acm...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.45	2 sources
helios.acme.com	EBS-1 / VM-1 / EC2 / Zone-1 / US East / A...	138.42.229.109	DX App...
neptune.acme.c...	WS_acme.com / acme.com-prod / KB-clus...	138.42.229.45	DX Net...
mars.acme.com	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.104	DX App...
bacchus.acme.c...	AS_acme.com / acme.com-prod / KB-clus...	138.42.229.43	DX Infra...
diana.acme.com	WS_acme.com / acme.com-prod / KB-clus...	138.42.229.45	DX App...
minerva.acme.c...	EBS-1 / VM-1 / EC2 / Zone-1 / US East / A...	138.42.229.108	DX Net...

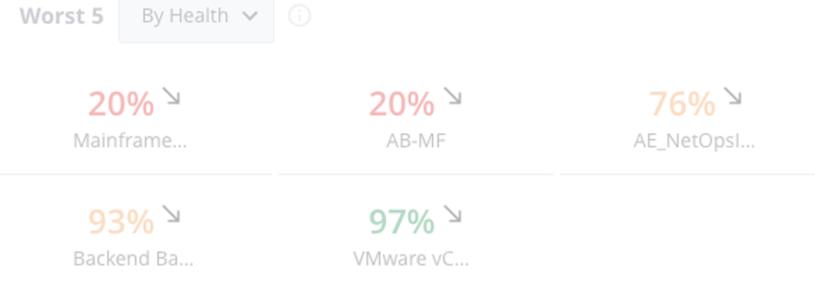
Unified Dashboarding and Reporting

- Built in data connectors for alarm, metric, inventory and topology store to create joint views for dashboards providing end to end view
- Drill downs from overview dashboards to detailed views combined with contextual launches of the product features like alarm analytics or service analytics, etc.
- More data granularity supported for widgets in a dashboard to help time based analysis
- Performance improvements to handle large scale of data

The image displays a comprehensive dashboard interface for monitoring and reporting. The main dashboard area is filled with various data visualization widgets, including a table, a large stat widget showing '11253', a gauge showing '33', a bar gauge showing '2400', a pie chart, and several line and bar graphs. A sidebar on the right provides navigation for 'Dashboards' and 'Reports'. The 'Dashboards' sidebar includes a search bar and buttons for 'New Dashboard', 'New Folder', and 'Import'. The 'Reports' sidebar shows a 'New report' form with fields for 'Title', 'Choose Dashboard', 'Recipients', 'Custom Message', 'Grid layout', and 'Scheduling'. Below the main dashboard is a grid of widget icons for Graph, Stat, Gauge, Bar Gauge, Table, Singlstat, Text, Heatmap, Alert List, Dashboard list, News Panel, Pie Chart, Polystat, Worldmap Panel, Diagram, Logs, Discrete, and Plugin list.

Filter  

All services   Show KPIs 



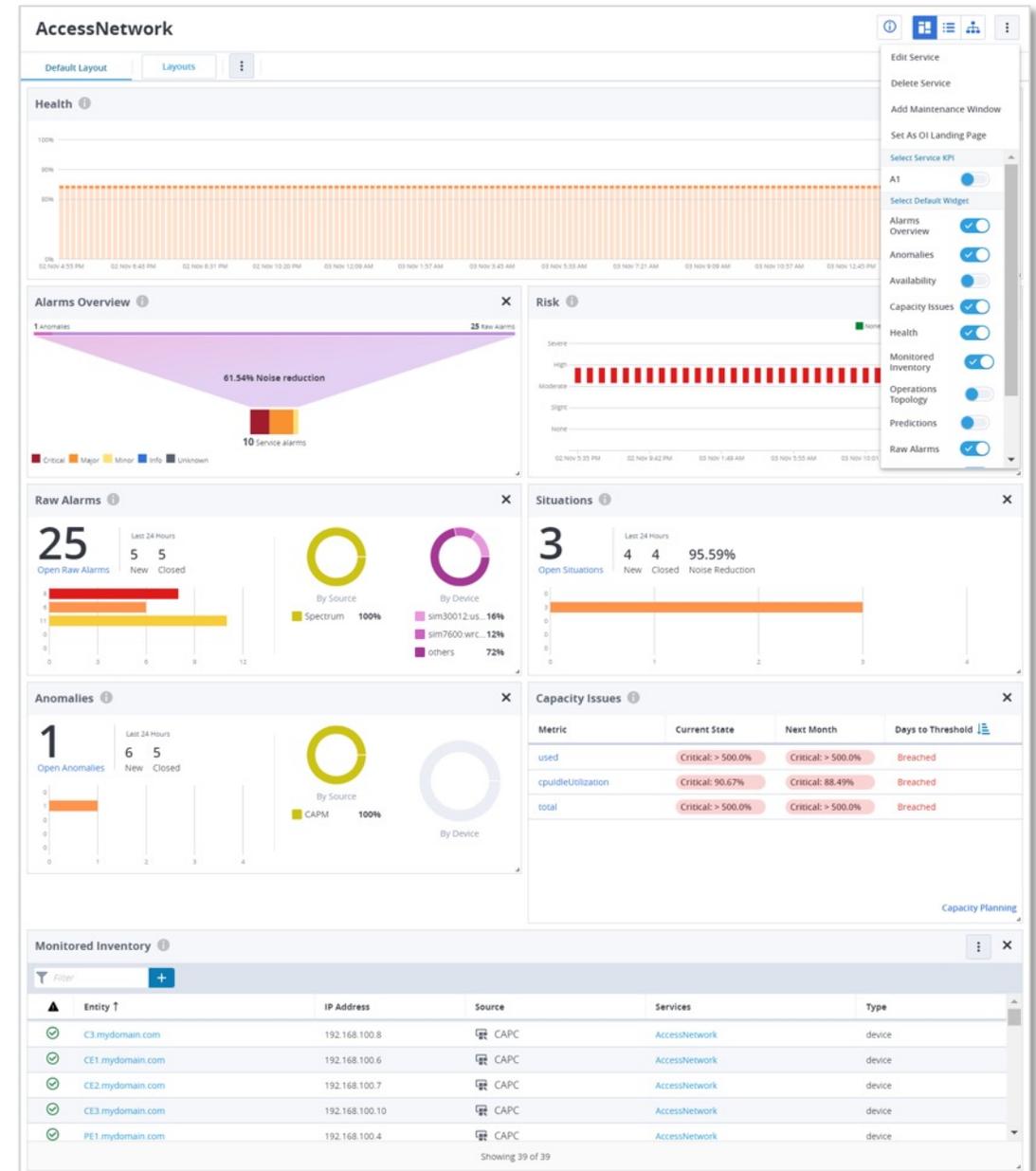
Services / Sub-Services (# Subs) 		Last 24 Hr Availability	Location 	Tags 	Health 	Situations (Subs) 	 Alarms 	Risk 
AccessNetwork 					100%	0	0	None
AE_NetOpsInfra 					76%	6	14	High
Ashburn-ASH 					100%	0	0	None
> CDN-Service (2) 			Boston	CDN Business	100%	0 (12)	1	Slight
> Colussus (2) 				Colussus	100%	0 (0)	0	None
> DigitalBanking (6) 					100%	0	0	None
> newtag 				newtag	100%	5	8	Slight
> DigitalBanking (6) 					97%	0 (40)	126	High

Empower Hybrid Teams with Service-Driven Operations



360 Degree Context for Service Owners/SREs

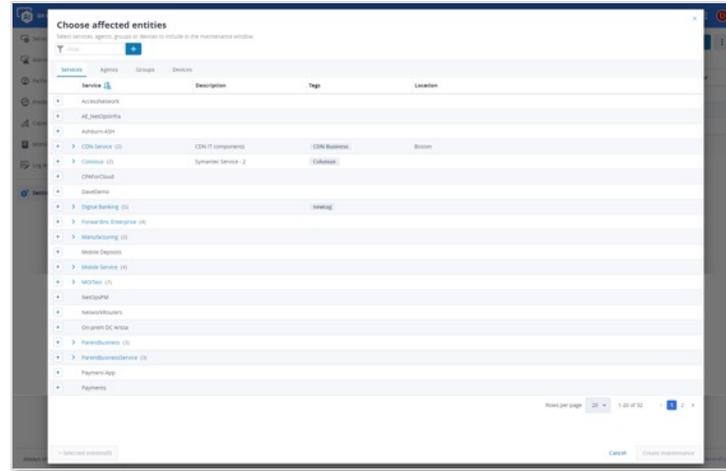
- Contextual information and navigation entry points for:
 - Health, availability and other KPIs with custom service KPI configuration
 - Monitored inventory that are a part of the service
 - Raw alarms and Situations trend over time to identify the health degrading components
 - Capacity projections at the service level to optimize resources in time
- Personalize the service details view for contextual widgets
- 1-minute service KPIs intervals to have the latest IT to Business view



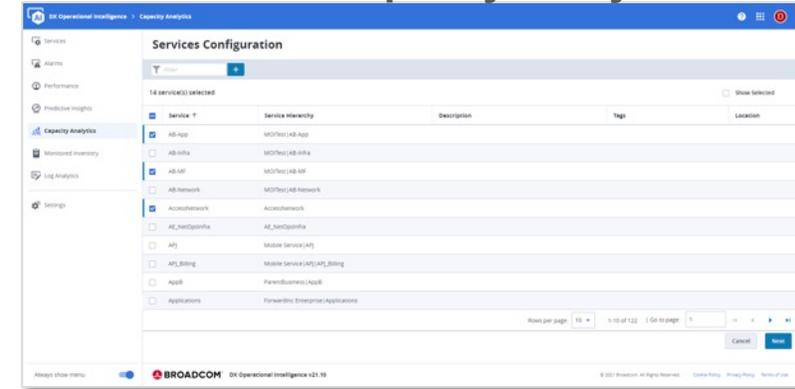
Service Driven Configurations for Consistent Anchor

- Maintenance windows can be configured for the entire service(s) to ease management and suppress alarms and tickets
- Predictive capacity insights can be enabled for services and leverage service KPIs for what-if analysis
- Filters across the product based on services and service tags providing an easy and consistent way as users navigate through their workflows
- Out of the box dashboards for service driven monitoring

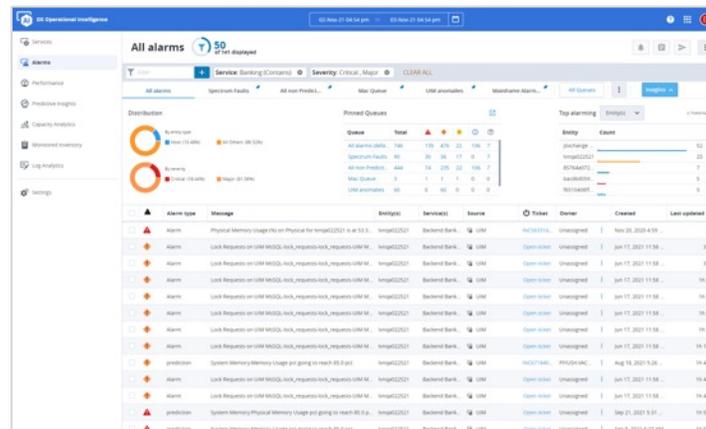
Maintenance Windows



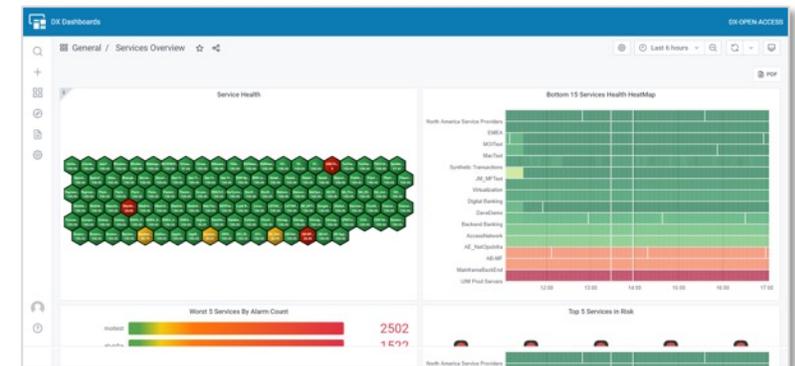
Predictive Capacity Analytics



Service Filters

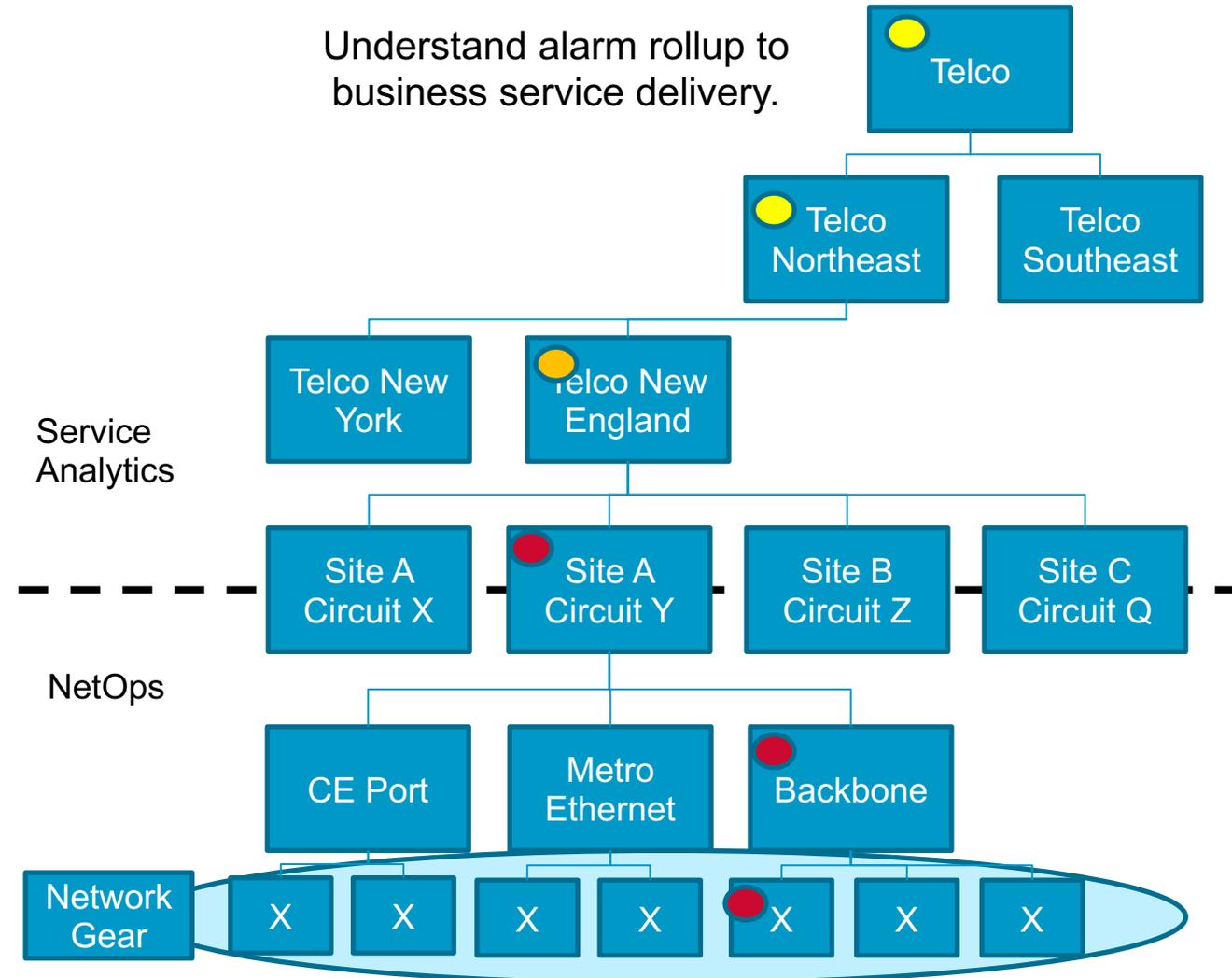


OOTB Service Overview Dashboard



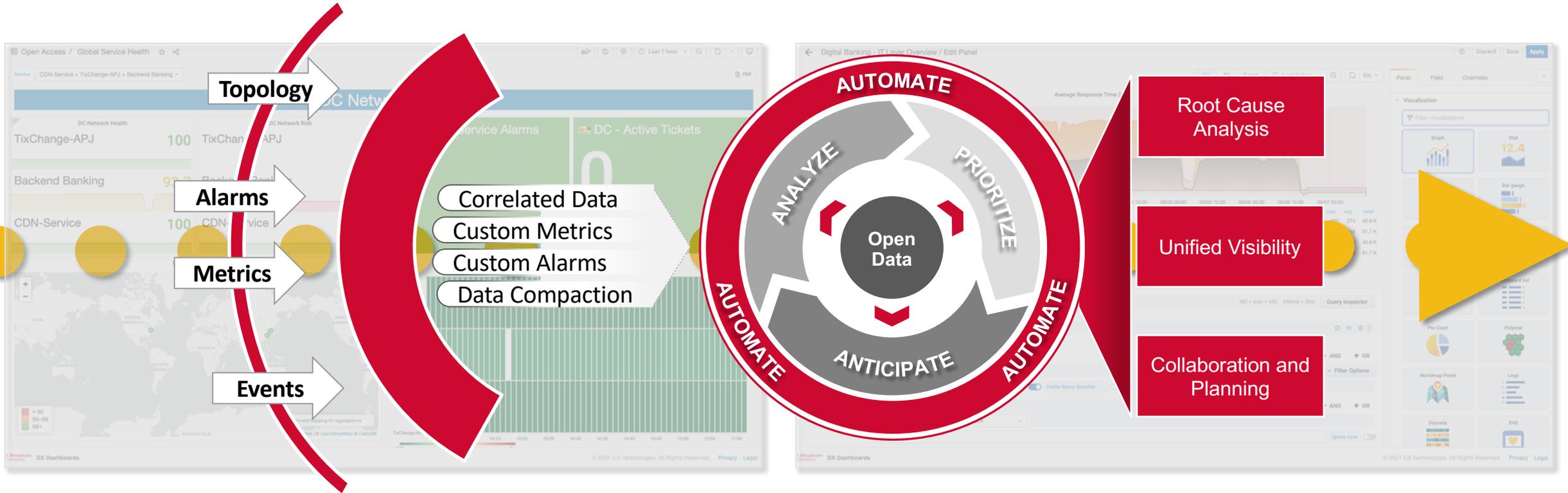
Network Services within DX Operational Intelligence

- DX NetOps (Spectrum) services can be leveraged within DX Operational Intelligence to view network services as part of cross-domain services
- Identify the impact of network services on business or IT services through this integration
- Easy configuration via Spectrum – OI connector (Spectrum Data Publisher)



Manage Services at Scale

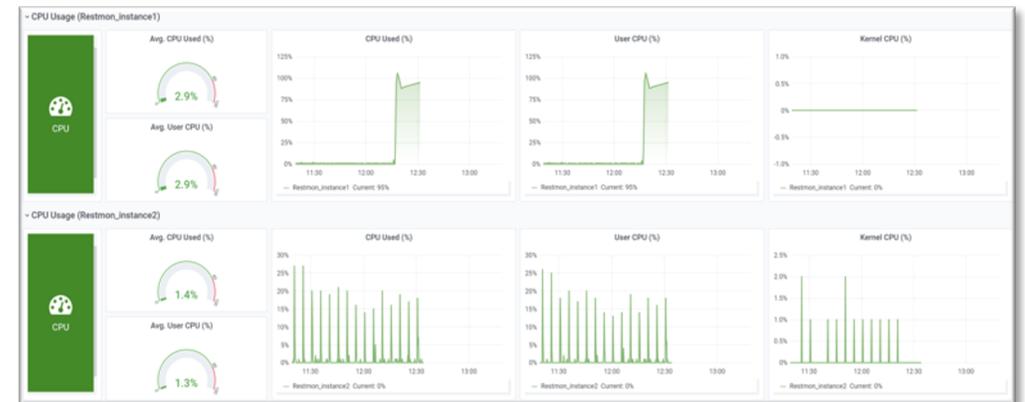
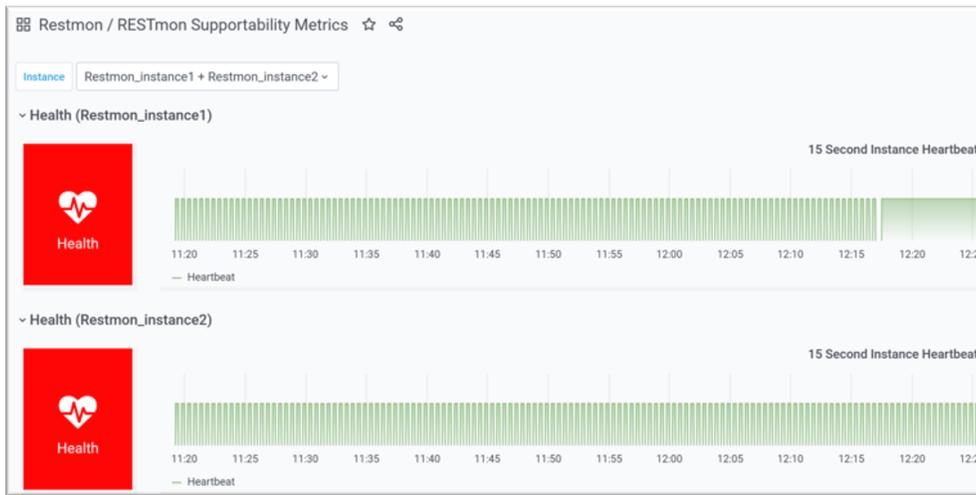
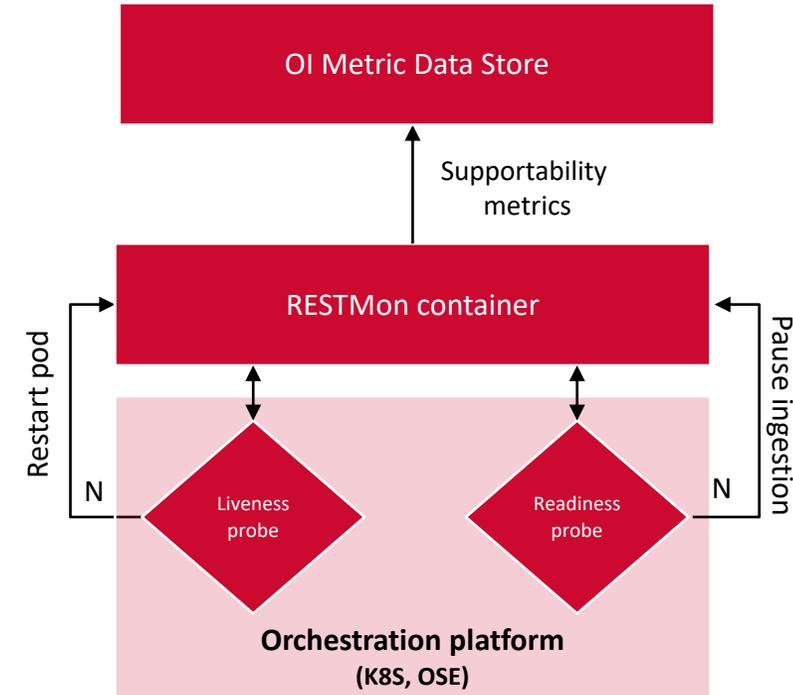
- Service Analytics supports up to 20k services across the service drive workflows
- Manage services programmatically via [CRUD APIs](#)
- Control and limit service management via out of the Power User role



Integrations

RESTMon 2.1 for 3rd Party Integrations

- Monitor RESTMon performance & health via OTB DX Dashboard
- Improve availability with Liveness & Readiness probes; Works OTB on orchestration platforms such as Kubernetes & OSE
- 7 New Reference Integrations available to get started
- Improved performance of the overall RESTMon framework



Enhanced Ticketing and Webhook Integrations

- New bi-directional integration added for BMC Remedy ticketing
- Additional filters based on service tags, alarm state, etc. for channel policy definitions
- Intuitive Webhook integration via UI with the ability to select the payload attributes and test/validate the Webhook connection before saving to ensure the integration was successful

The screenshot shows the 'Create Generic Webhook' configuration page in the AIOps interface. The page has a blue header with the AIOps logo and a notification icon. The main content area is white and contains the following sections:

- Enable the channel:** A checkbox that is currently unchecked.
- Channel Name:** A text input field with a 'Required' label.
- Webhook URL:** A text input field with a 'Required' label. Below it, a note says 'Enter URL with http:// or https://'.
- Authentication Type:** A dropdown menu currently set to 'No Authentication'.
- Webhook Headers:** A section with a 'Key' dropdown (placeholder: 'Enter or select key') and a 'Value' text input (placeholder: 'Enter value').
- Webhook Payload:** A large text area with a note: 'You can either copy and paste or select the payload data file from "Add Keys" button.' There is an 'Add Keys' button and a 'Required' label.
- Linked Policies:** A dropdown menu.
- Buttons:** 'Delete', 'Cancel', 'Test', and 'Create' buttons are located at the bottom of the form.

At the bottom of the page, there is a footer with the Broadcom logo, 'AIOps', and copyright information: '© 2021 Broadcom. All Rights Reserved. Cookie Policy Privacy Policy Terms of Use'.

- Select filter attribute...
- Acknowledged
 - Age (In min)
 - Alarms Count
 - Annotation
 - Closed Products
 - Closure Ts
 - Cluster Previous Name
 - Hosts
 - Initial Impacted Host
 - Initial Impacted Services
 - Initial Impacted Template
 - Is Closed
 - Is Force Closed
 - Is Orphan
 - Is Stable
 - Maintenance
 - Message
 - Most Impacted Host
 - Most Impacted Service
 - Most Impacted Template
 - Noisy
 - Primary Root Cause Host
 - Primary Root Cause Service
 - Primary Root Cause Source
 - Root Cause Message
 - Root Cause Relative Confidence
 - Root Cause Score
 - Root Cause Severity
 - Root Cause SubCluster Id
 - RootCause Count
 - Service
 - Severity
 - Situation Id
 - Situation Source
 - Source
 - Stable Time
 - Start Time
 - Status
 - SubClusters Count
 - Timestamp



Settings



Data Sources

Setup Data Sources

Download the DX Gateway to ingest a wide variety of data: metrics, events, alarms, logs, inventory groups, etc.

[Setup](#)

Connector Parameters

Connector Parameters

Find the unique keys required to integrate on-premise deployments

[View](#)

11 Monitoring Groups

Configure Monitoring

Set what is monitored and how (anomaly detection, prediction, capacity planning, etc.)

[Configure](#)

17 Predictive Definitions

Enable Predictive Definitions

Enable and customize predictive data definitions for metrics

[Enable](#)

25 Policies

Create Policies

Deploy policies (including data ingestion, alerting, and remediation) to your environment

1 ITSM

Connect Ticketing System

Connect with a ticketing system (e.g. Jira, ServiceNow) to manage incidents

15 Notification Channels

Connect Notification Channels

Integrate with email, slack and other Webhook-based channels

7 Message Templates

Create Message Templates

Create custom messages, with system variables, to be reused across notification channels

Deploy and Manage with Ease

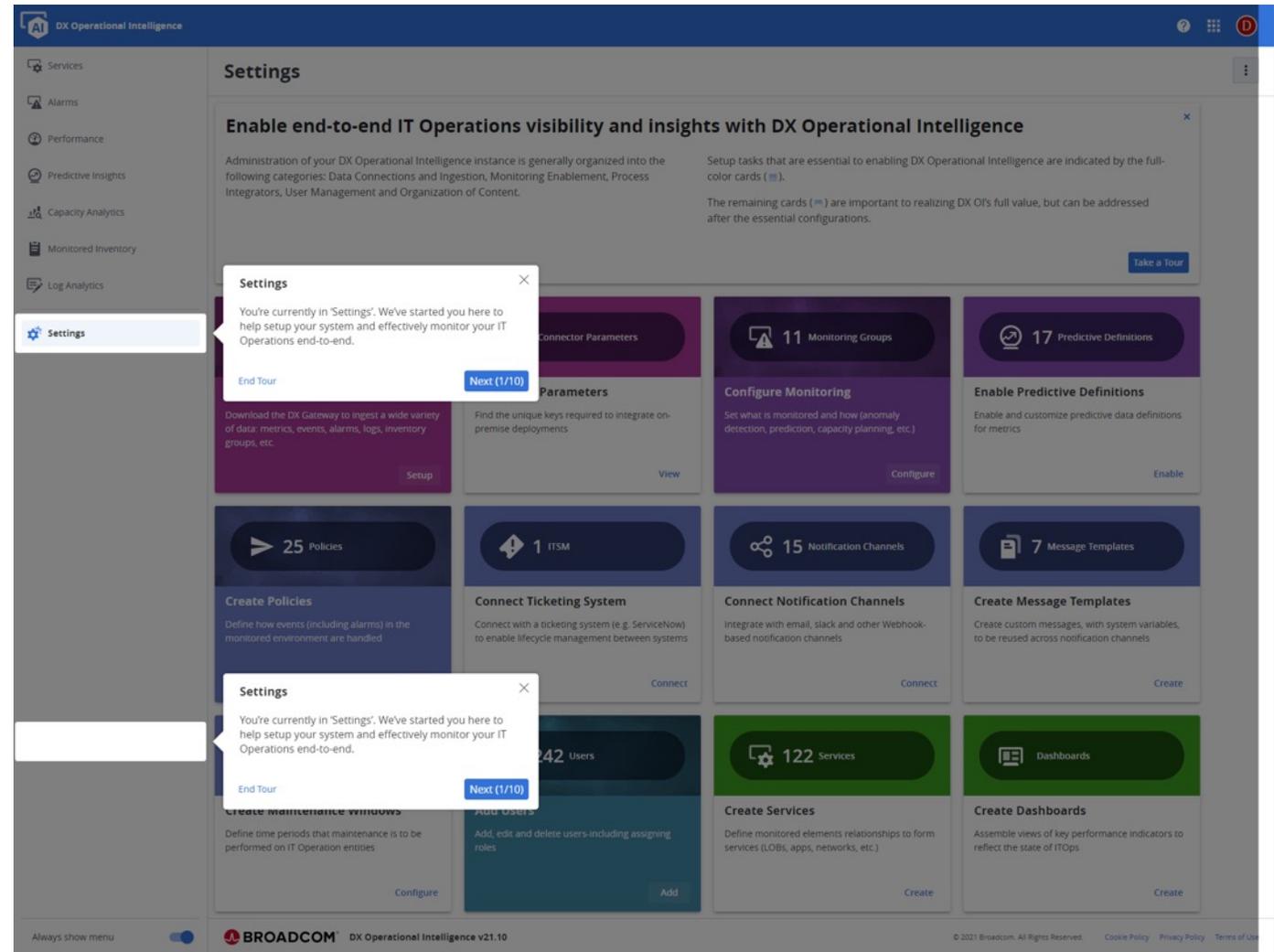


Improved Seamless Installation Lifecycle

- IOPS evaluation pre-requisite for the installer
- Minimized footprint and Export by product for ease of downloads
- Download tokens to control authorized downloads
- Improved Uninstall script
- Path to upgrade from 20.2
- Role-based administration for
 - Cluster administrator
 - Define namespace
 - Define persistent volumes (PVs)
 - Define high-level directories
 - Application administrator
 - Install application using non-privileged ID
- Supported on OCP 4.7 and K8s 1.21

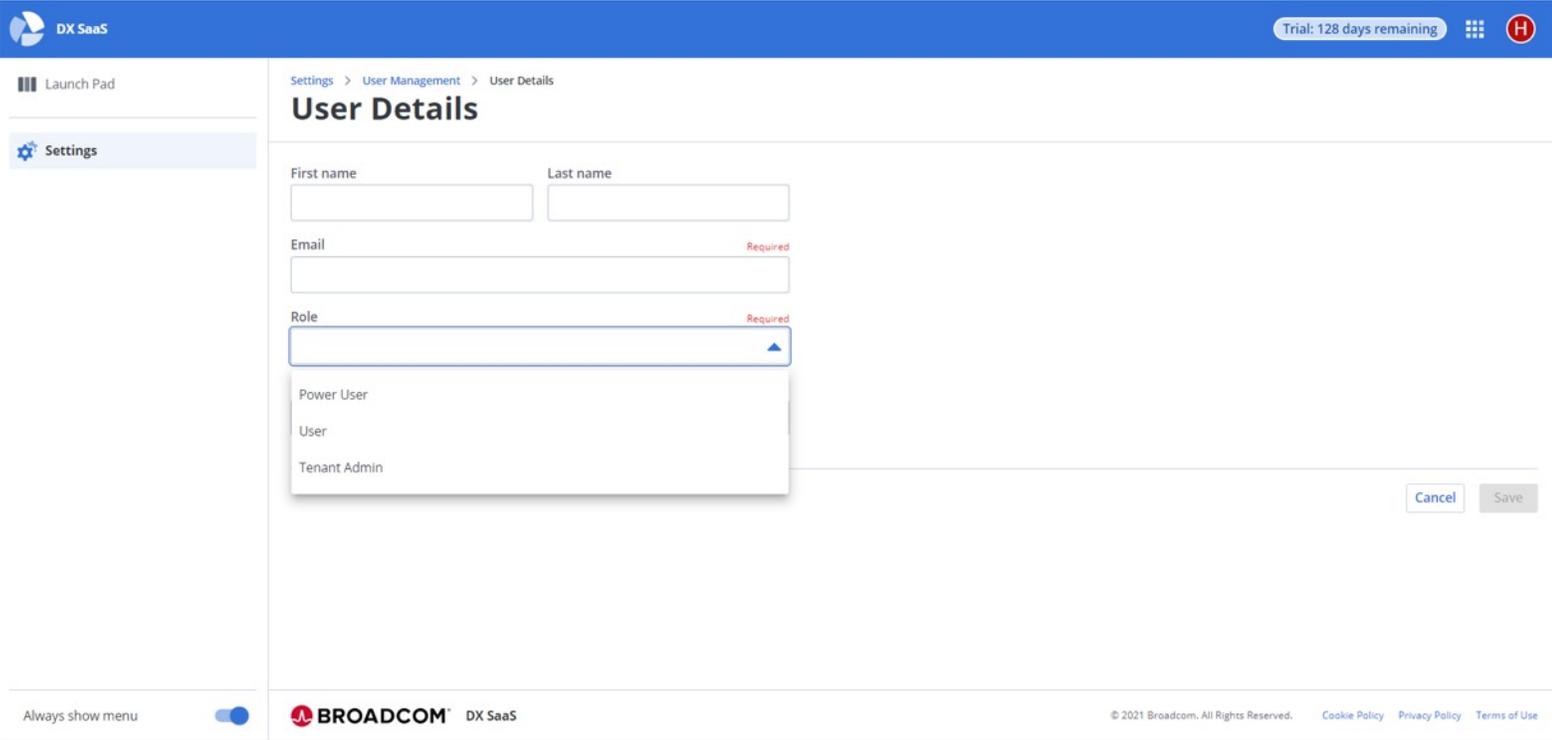
One Stop Settings Page for Easy Tenant Onboarding

- Default landing page for 1st time login of Tenant Administrator
- Provides a virtual tour to familiarize the Tenant Administrator with the Settings page
- Provides all the configurations required for tenant administration in a single view along with the high level summary of the existing configurations



Out of the Box Roles to Control Access and Privileges

- Out of the box roles across the platform to assign pre-defined privileges for :
 - Tenant Administrators: Everything
 - Power Users: Everything except tenant onboarding and user management
 - Users: Primarily read only access
- Provides mapping with SAML groups



The screenshot displays the 'User Details' form in the DX SaaS interface. The form includes fields for 'First name', 'Last name', 'Email', and 'Role'. The 'Role' field is a dropdown menu with a 'Required' label, and its dropdown list is open, showing three options: 'Power User', 'User', and 'Tenant Admin'. The interface also features a 'Launch Pad' sidebar, a 'Settings' link, and a 'Trial: 128 days remaining' notification. At the bottom, there is a footer with the Broadcom logo, 'DX SaaS', and copyright information.



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