Niagara Cloud Services

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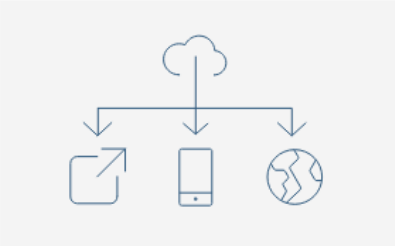
Agenda

- What is the Cloud (5 min)
  - Cloud Benefits
- What is Tridium doing in the Cloud? (40 min)
  - Backup-as-a-Service
  - Asset Manager
  - Marketplace
  - MQTT Connectivity
  - Niagara Cloud
- Q&A (q.s)

What is cloud computing?

What is cloud computing?

It refers to the use of computing resources that are located somewhere else and accessed in the “cloud” of remote networks

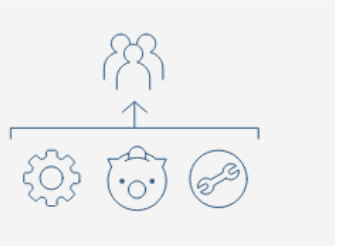


Flexibility

Users can scale services to fit their needs, customize applications, and access cloud services from anywhere with an Internet connection.

Efficiency

Enterprise users can get applications to market quickly without worrying about underlying infrastructure costs or maintenance.



Strategic value

Cloud services give enterprises a competitive advantage by providing the most innovative technology available.

Benefits of Cloud Services

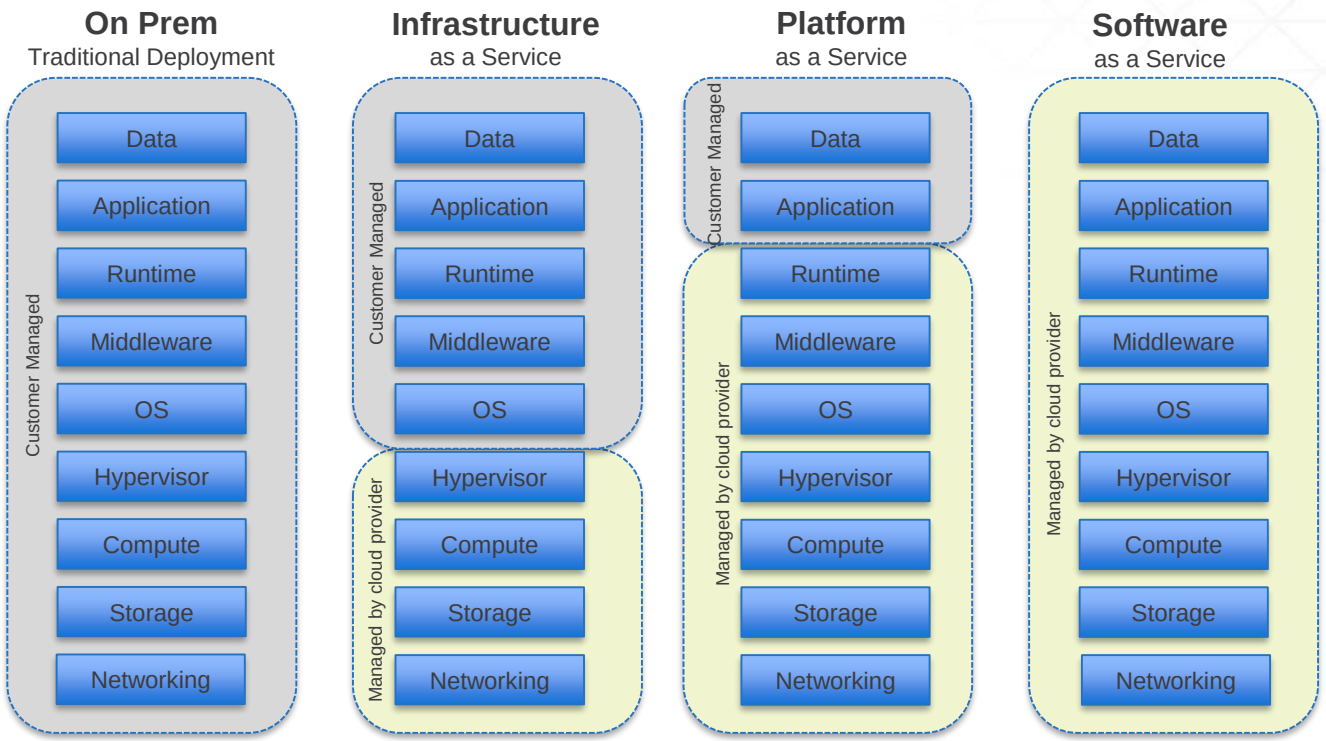
CUSTOMERS

- Lower upfront costs
- Reduced lock-in
- Flexibility – scale up or down
- Pay only for what you use
- Automatic Updates
- Security
- Collaborative

PROVIDERS

- Increased revenue
- Predictable revenue
- Operational Savings
- Sell more services
- Improved customer service
- Better customer relationships
- Collaborative

Cloud Models - IaaS PaaS and SaaS



** Data belongs to the user, even if it is stored in an infrastructure that is owned by a cloud service provider (IaaS or PaaS), or managed by the cloud service provider (SaaS).*

Cloud Roadmap – Services View

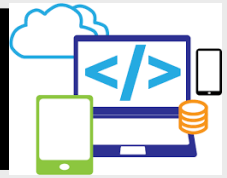
Initial Services | Connectivity and Design | Core Niagara SaaS | Analytics and Analytics-based Services | Niagara ++ | Developer Platform

Product Roadmap

2017

Future

Application Framework



1 **Backup-as-a-Service**
Cost-effective automated offsite cloud backup for disaster recovery

2 **Asset Management**
BMS Asset View and Management

3 **Data-as-a-Service**
NCloudDriver - License data connector/service to select non-competitive partners for their business applications

5 **Niagara Cloud UX**
BMS, Consumes cloud services, Billing, Account Management

4 **History as-a-Service**
Ndrive – Sync and store history in the cloud; Display w/ visualization

6 **Scheduler-as-a-Service**
Worksheets to schedule, connect and create dependencies; in the cloud

7 **Mobile App**
Mobile app for iOS and Android

8 **Alarm-as-a-Service**
Secure cloud-based alarms and notifications via native mobile app. Escalations of alarms and notifications to subscribed/assigned recipients

9 **Remote Control as a Service**
Allow customers to remotely connect, view and control set points and configuration parameters

10 **Supervisor-as-a-Service**
Mini cloud/mobile Supervisor and/or changed, improved license and user management; Enable SIs to run current Supervisors on VMs and offer as-a-Service to end customers

11 **Analytics-as-a-Service**
Diagnostic, Preventive and Prescriptive Analytics on aggregated controllers w/ rules engines, big-data analytics and ML/AI. Application/Domain specific packs.

12 **Diagnostics-as-a-Service**
Remote diagnostics of customer issues. FDD.

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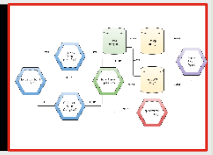
Platform Framework



5' **PaaS Platform UX**
Cloud Microservices Platform
Niagara Microservices Developer Environment
Marketplace, Metering and Billing
Portability to multiple cloud platforms
Integration with GitHub, Local repo and CLI

8' **Application Service Framework**
Cloud Microservices Platform
Service and application creation, management, control, billing and code management.

1-22 **Niagara Microservices**
Cloud Microservices Platform
Services available in Marketplace:
Backup, Alarms, History, Scheduling, Analytics, Diagnostics, Data, Tagging, Logging, Mobile

17' **Developer tools**
Tools to allow developer community to build customer SaaS offerings
- REST interface (for 3rd party apps or web APIs)
- Extensible UI and Driver framework
- App management tools

SaaS Services | PaaS Platform Services

Cloud Roadmap Objectives

1

Manage Your Devices

Connectivity
Asset Manager

2

Manage Your Data

History as a Service
Backup as a Service

3

Insights into your facilities

Analytics Service
Diagnostics Service
Smart Alarms Service

4

Improved Operations & Productivity

Mobile App
Marketplace

5

Develop your own Apps

Platform
Tools

Backup as a Service

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Why Backup Service?

“It's a BIG DEAL if they can't find their latest backup…”

“Of the customers we serve, probably 1-2 a year have a failure from which they cannot recover due to not being able to find a backup…”
A large HVAC Contractor and Engineering Firm from Maryland

“[We back up] the whole kit & caboodle.”
HVAC Contractor, Minnesota

Backing up is super high value when you need it. We push our customers to back up but there’s only 1% chance they do. We push our onsite technicians to backup but still only about 75% chance they do. As a part of the Maintenance agreement - regular visits are used for backups.
System Integrator and Engineering Firm from Virginia

It can take $10K worth of man hours to recreate a device if its backup can’t be found

A large distributor, Minnesota

“It could be a week old and there will be a lot of changes in a week. ... we get a little lax [about backups] sometimes too, cause you get busy...”
A facilities manager for a campus in Minnesota

"that would definitely ease a lot of tension with customers“
HVAC Contractor, Maryland, on the idea of backups with SMA

We lose backups - We do backups of their machines, they upgrade their machines. and then we don't know where it is at. Then backups age. Problem occurs years later. Then we ask questions like “Hey do you have his old laptop from 5 years ago?”
System Integrator and Engineering Firm from Virginia

“A Niagara Carbonite service would be nice…”
Automated HVAC Controls Company in Minnesota

Back up your data and safeguard your business with Niagara Cloud

Introducing our first Service offering

Backup as a Service
BaaS provides seamless, secure and scalable backups of Niagara stations from the devices to the cloud.

Any good cyber security approach should include backing up your critical infrastructure. JACEs and Supervisors are a part of mission critical infrastructure.

Back up your data and safeguard your business with Niagara Cloud

Backup as a Service Features

01 **Bundled with existing SMA**
Included with your SMA if you have N4.3. Buy more storage if needed

02 **Initiate JACE backups with 1 GB of cloud storage**
Supervisor backups with 5GB of storage

03 **Automatic/Scheduled or manual backups**
Time, event or manual triggers for the backups

04 **Secure Service**
Data encrypted in transit and at rest.

05 **View, download or delete backups**
Manage your online storage; keep the backups you want;

06 **Add notes to each backup**
Get the context and additional information associated with each backup

07 **Backup what you want**
Option to backup alarms and histories; Bog and manifest always backed

08 **Configure Alarms for unsuccessful backups**
Ability to configure alarms so that backup failures never go under the radar

09 **Niagara Community Credentials**
Reduced password fatigue; use your existing credentials

10 **Soft backup limits**
Create backups even when limits are exceeded temporarily by a predefined amount. System automatically makes space by deleting oldest backups*

11 **For Niagara 4.3**
Makes a case for an upgrade; Cloud connectivity comes built in

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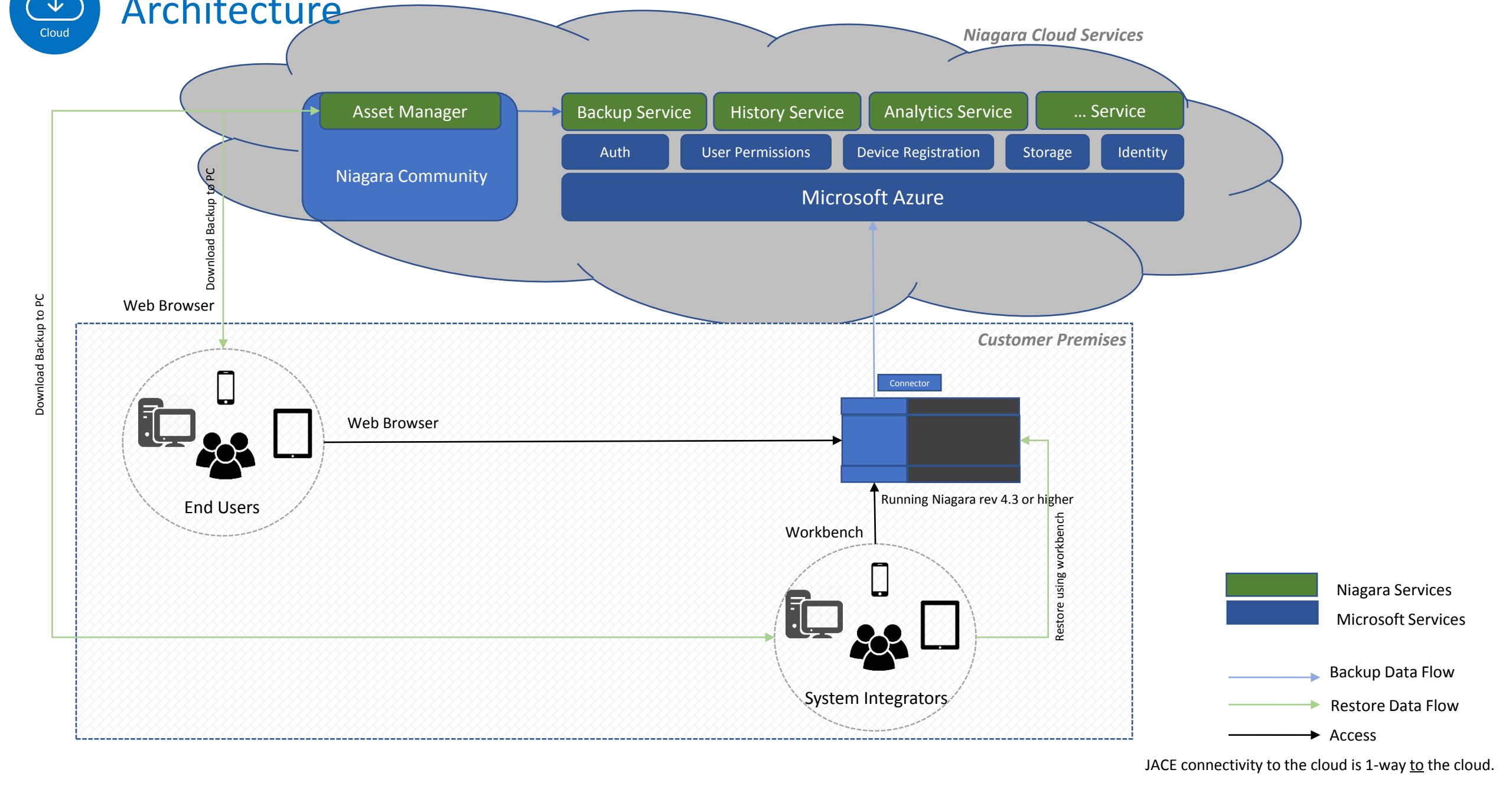
Architecture



JACE connectivity to the cloud is 1-way to the cloud.

BaaS solves your unique challenges

Removes the need to remember and spend time to run periodic backups of the JACE

Removes the need to track down the latest backup of the station when a failure occurs

Removes the need to maintain a server to manage and store JACE backups

FAQs

How much does Backup as a Service through Niagara Cloud cost?

Niagara Cloud is bundled with the Software Maintenance Agreement (SMA).

There would also be a premium service we would launch shortly.

What are the version compatibilities of the initial release of Backup as a Service?

Niagara Cloud is compatible with Niagara 4.3 and up.

Would I be able to access my data if my SMA expires?

If you have backed up your devices, you will have a 90-day grace period where you can still download your backups after your SMA has expired.

Where will my data be stored?

Your data is stored in Microsoft Azure in Microsoft's Data Centers.

Is my data safe?

Your data is encrypted end-to-end—in transit and at rest. This makes it impossible for any third parties to view your data. For the purpose of providing Backup-as-a-Service, the JACE only makes outgoing connections.

What security technologies do you use?

We use AES 256 to encrypt the data, and TLS 1.2 for securing the HTTPS communication.

Asset Manager

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Asset Manager

Introducing an asset management solution that doesn’t require a spreadsheet

Niagara Community website now includes a powerful asset manager tool that lets you manage all your installed Niagara licenses from one online location.

Back up your data and safeguard your business with Niagara Cloud

Features of Asset Manager

01 Centralized, brand-agnostic view of all Niagara license information

02 Easy access to specific device details through filters

03 Access to device backups via Niagara Cloud Backup-as-a-Service

04 Automatic push notifications of maintenance expirations and renewals

05 JACE context via personalizable, custom fields

06 Access to Niagara Licensing and Customer Portals through single log-in

07 Web-based; 24x7x365 Availability

08 Secure; Roles and permissions built in

Back up your data and safeguard your business with Niagara Cloud

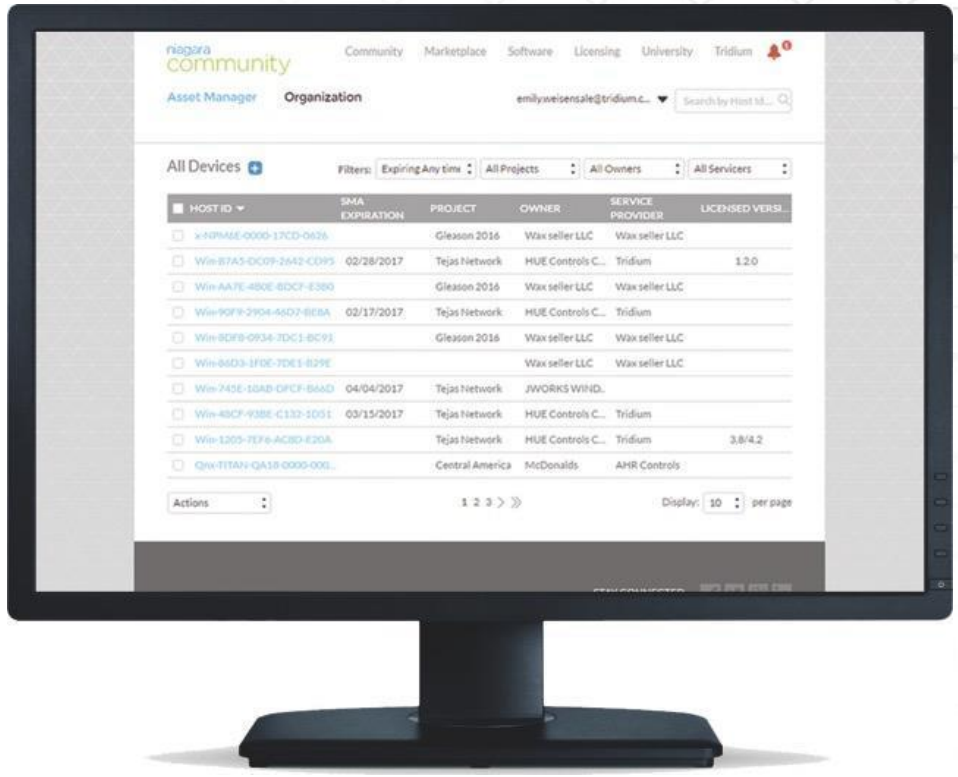
License Data at your fingertips

Device Data

- Brand
- Model
- Software maintenance expiration
- Licensed software version
- Software options

Customizable Data

- Owning organization
- Service providing organization
- Project tag
- Address
- Installed software version
- Notes



Value Proposition

End users

No more manual updates of spreadsheets containing install information

Systems integrators

Maintenance renewal information for all projects from one central location

Marketplace

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Marketplace

The marketplace is an online portal, facilitated by Tridium, where the customers (consumers) and partners (providers) meet.

It provides an ability to customers to find, review and buy products and services that are useful for them; and for the partners to have a presence to showcase their products and services and sell them.

Why Marketplace?

1

Discovery Problem

What to buy?
Is it good?
Will it work for me?
What do others say?

2

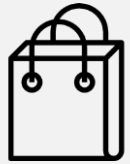
Purchase Problem

How to buy?
Who to buy from?
Is this a good price?

3

Selling Problem

How to sell?
Who to sell to?
How to effect transactions?



4

Reach Problem

How to reach out to the community?

Features of Marketplace 2.0

01  Intuitive, easy to use, modern design

02  eCommerce Enabled

03  Ability for Partners to self-publish their products

04  User-reporting analytics for potential customers and visitors

05  Ratings and reviews of the products

06  Flexible business models - free, subscription and freemium models

07  Partners' ability to showcase product w/ images, videos and docs

08  Flexible pricing and billing

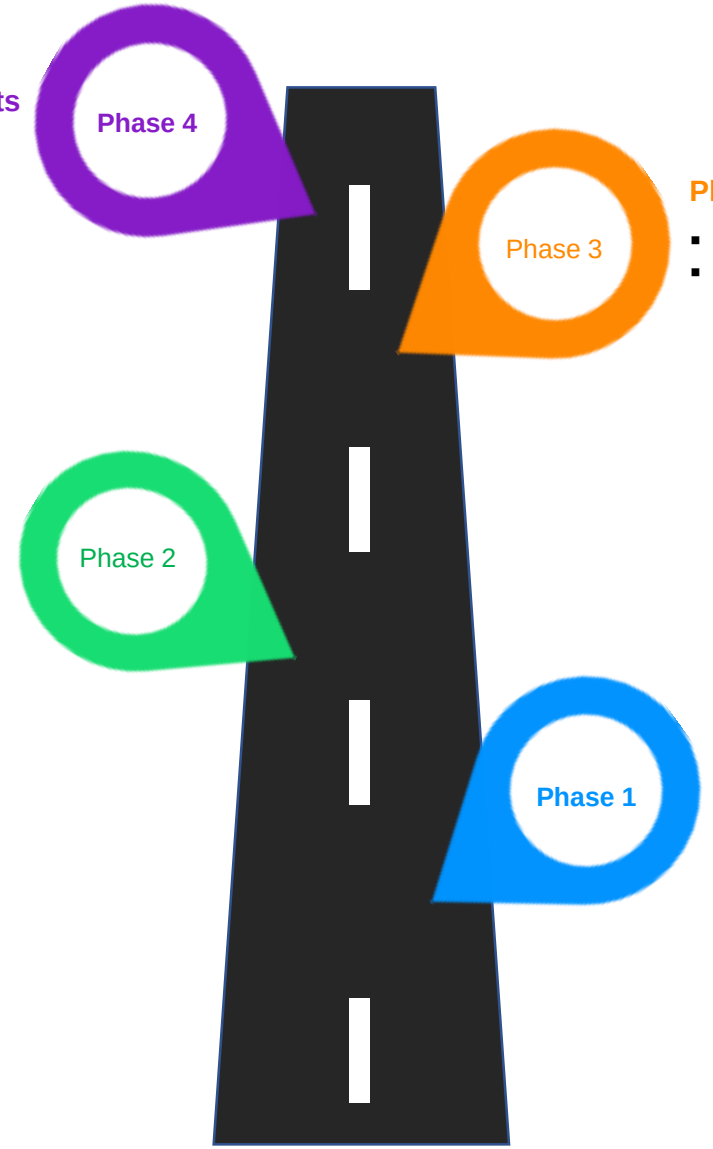
09  More secure; More defined roles and permissions

Back up your data and safeguard your business with Niagara Cloud

Marketplace Roadmap

Phase 4: Developer Portal and Future Enhancements

- Developer Portal
  - Developer Registration
  - Sandbox
  - GitHub integration
  - Photos and Videos
  - Tech docs repository
  - Tools
- Ratings and feedback



Phase 3: Third Party Developer Support

- App testing for submitted 3rd part developed apps
- Developer Program
  - Forums
  - Developer Registration

Phase 2: Marketplace with e-Commerce and automated backend

- eCommerce enabled
  - Shopping cart
  - Capture payment instrument
  - Payment gateway
  - Niagara cloud services available on Marketplace
- Fully integrated backend with licensing and billing
- Training Transaction

Phase 1: Marketplace with Manual Backend

- Migrating existing Marketplace to the new model
- Migrate existing customers to the new Marketplace
- Fully operational lead-generation capability
- Ratings and reviews of products
- Videos and multimedia product listing capabilities
- Partners' ability to self-publish products on Marketplace
- Accepting new partners on the platform

Connectivity

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MQTT

Message Queueing Telemetry Protocol. A protocol of choice for IoT connectivity.

1

Low Overhead

Minimizes over-the-wire footprint

2

Low Latency

Expects and caters for high latency in the network

3

Publish Subscribe Mechanism

Allow devices to get control messages behind firewalls.

Allows subscription to specific topics of interest, reducing traffic collision

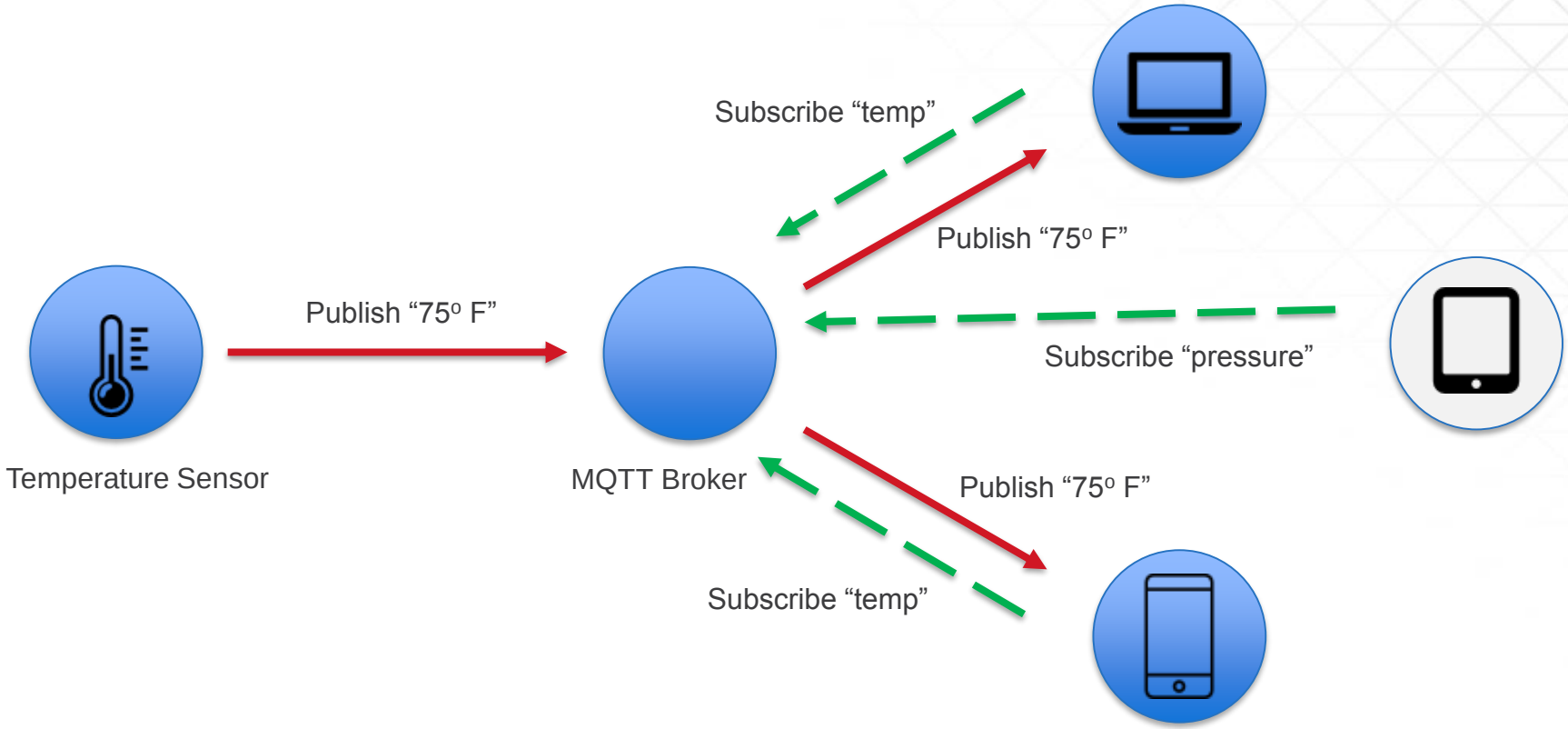
4

For Resource-Constrained Client Applications

Simple protocol for simple applications

It is specifically designed as an extremely lightweight publish/subscribe messaging transport.

Publish Subscribe Model



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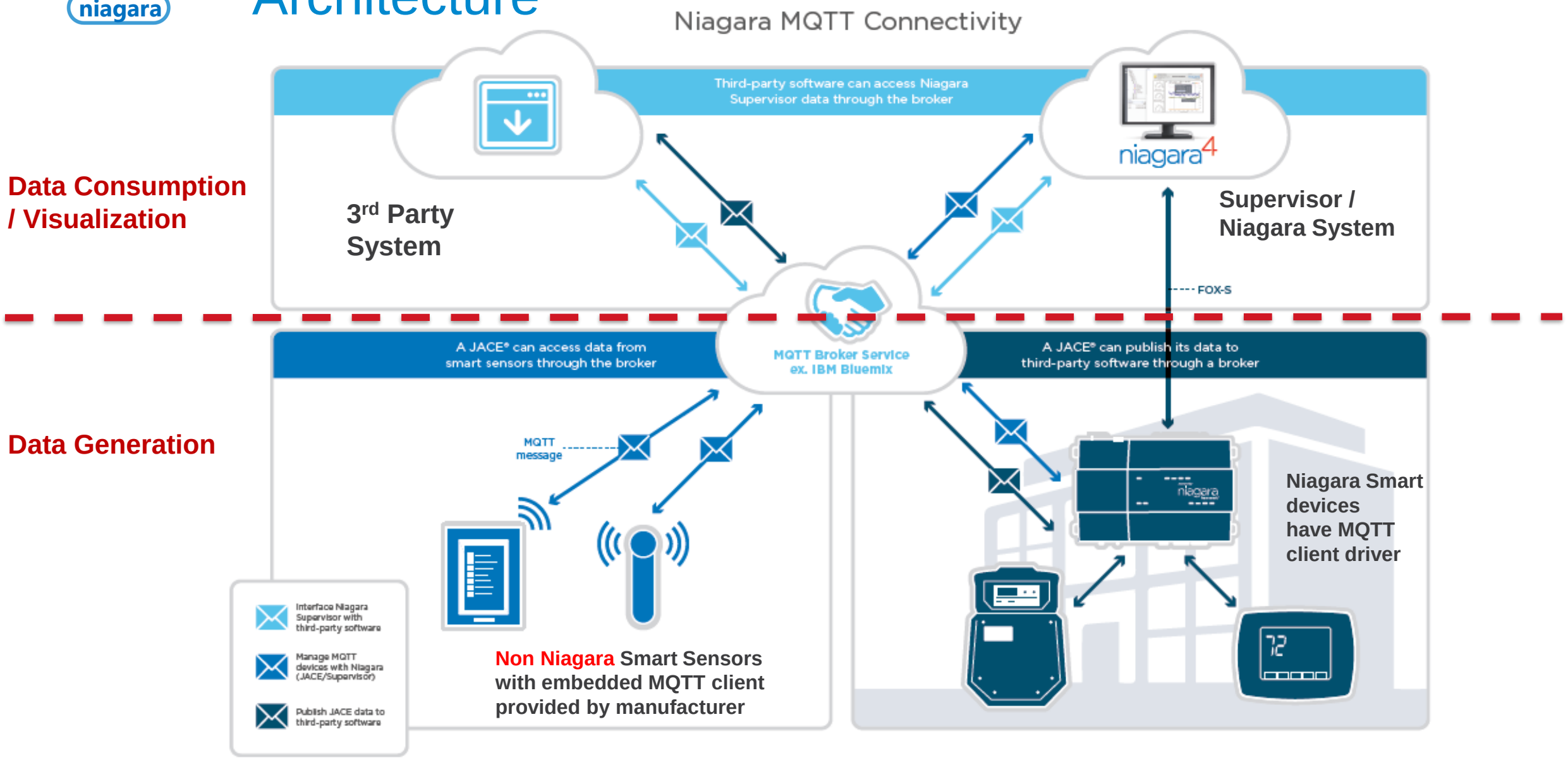


Value Proposition

1

Integration with 3rd party IoT Devices

Customer sites that have MQTT devices like smart sensors etc. along with traditional field devices installed. Niagara can ingest data from MQTT devices and traditional field bus devices.

2

Integration with upstream 3rd Party Services

Enables Niagara integration with upstream third-party services like IBM cloud service.

3

Network Firewall Friendly Architecture

Many customers IT department would not allow to open up public IP with inbound port due to security reasons. MQTT based architecture is suitable for them

4

Easy Adoption for Current Niagara Customers

Easy to adopt for current Niagara users as it follows standard driver model

5

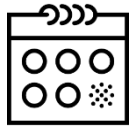
Secure

Secure options (TCP over SSL) for MQTT broker connectivity.

Niagara Cloud

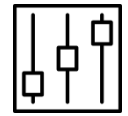
Niagara Cloud

Connectivity



Scheduler

Alerts



Point Control

Histories

Monitoring

Niagara Cloud Customers

01 Facilities up to about 100K square feet

02 Customers with Budget Constraints

03 Customers without Supervisors

04 Customers looking to expand access
Without sharing VPN access or setting certificates

05 Customer looking for automatic updates of Supervisor

06 Customers looking for an extensible solution
For points and Storage

07 Customers who want to pay-as-you-go without lock in

08 Customers who don’t have technical staff to manage PC

09 Customers looking for a BMS Solution without IT issues

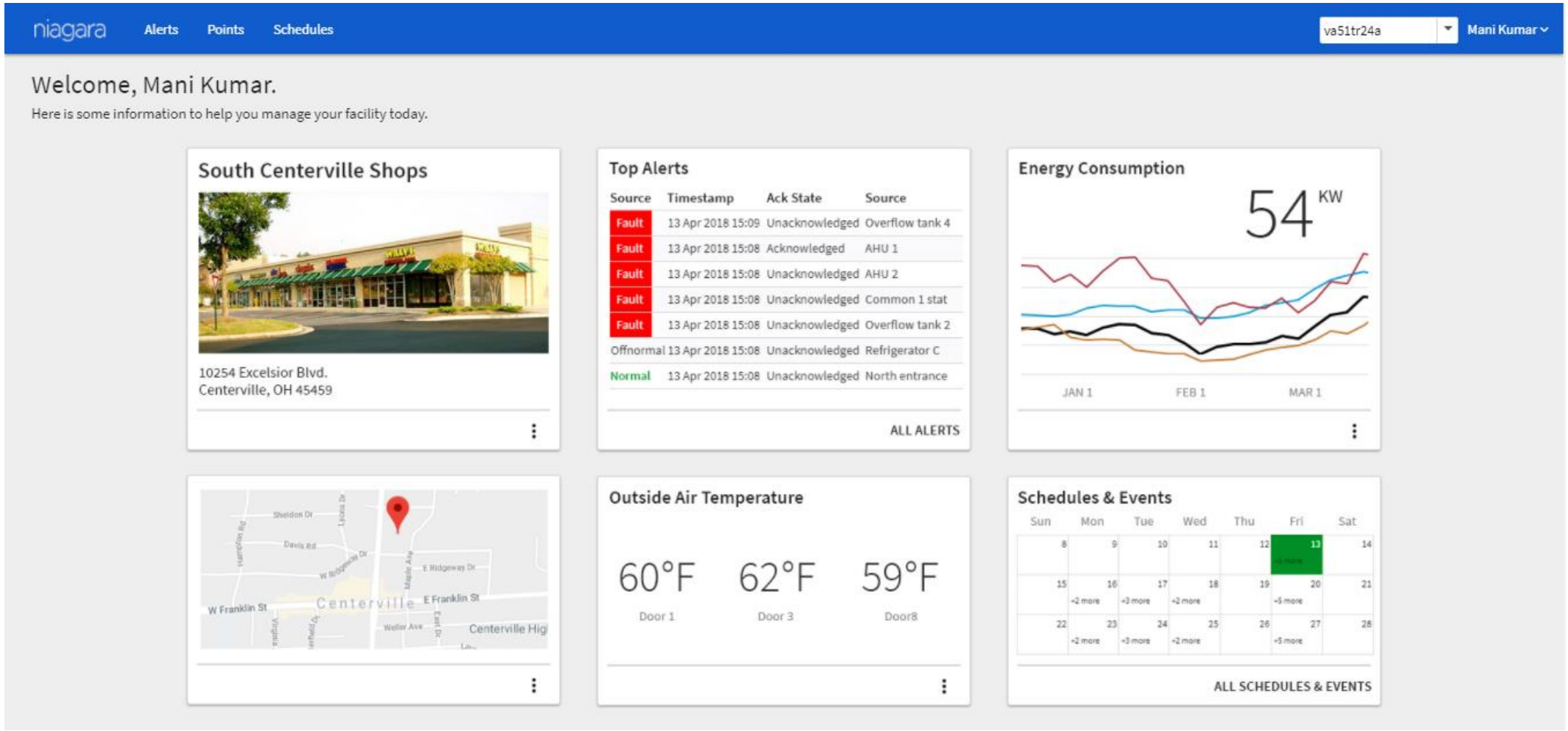
Niagara Cloud Value Proposition

- ❑ Mobile Experience
- ❑ Intuitive, modern design
- ❑ No lock in
- ❑ Budget Constraints
- ❑ IT issues
- ❑ Fast and good Out of box experience – fast time to value

Product is ready to roll out. Sign up for EA Today!

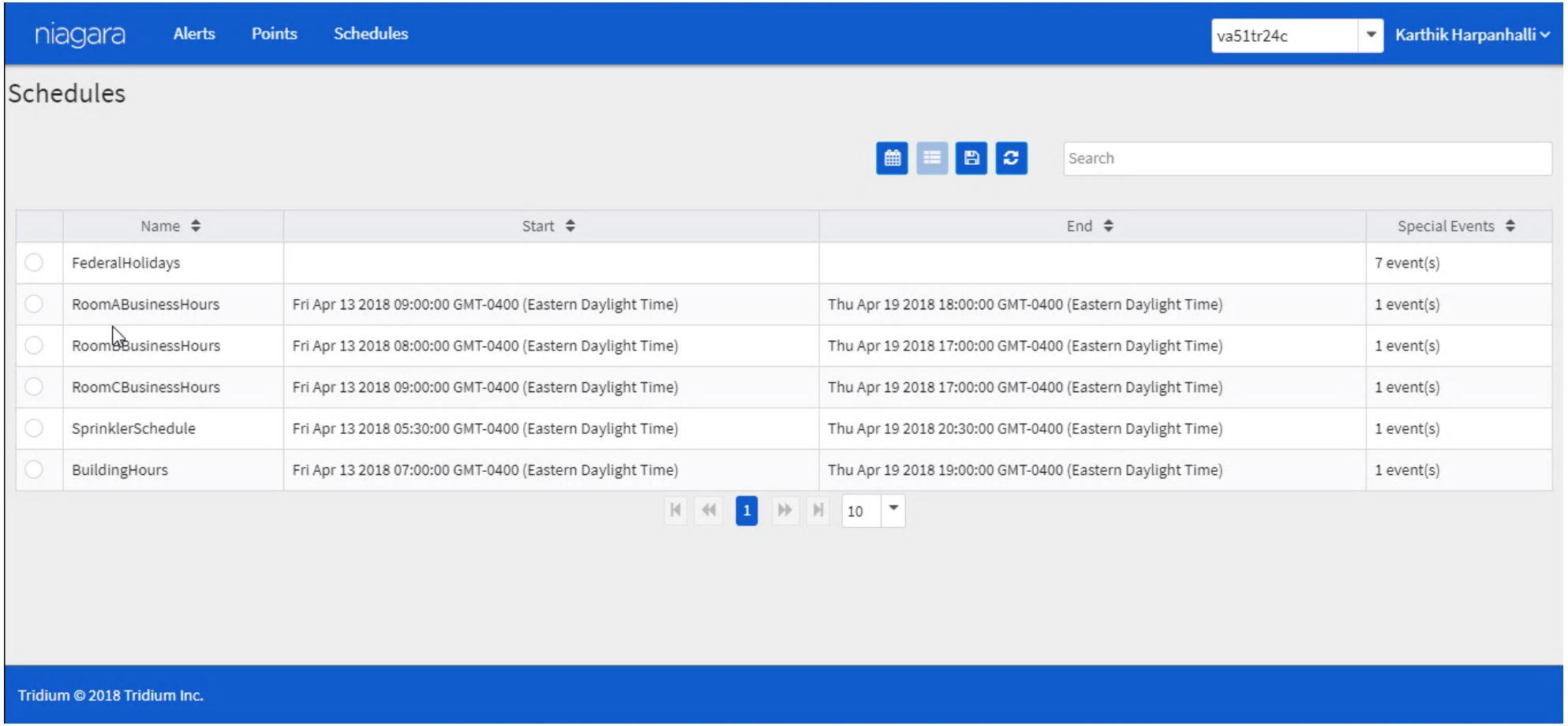
Niagara Cloud

Dashboard



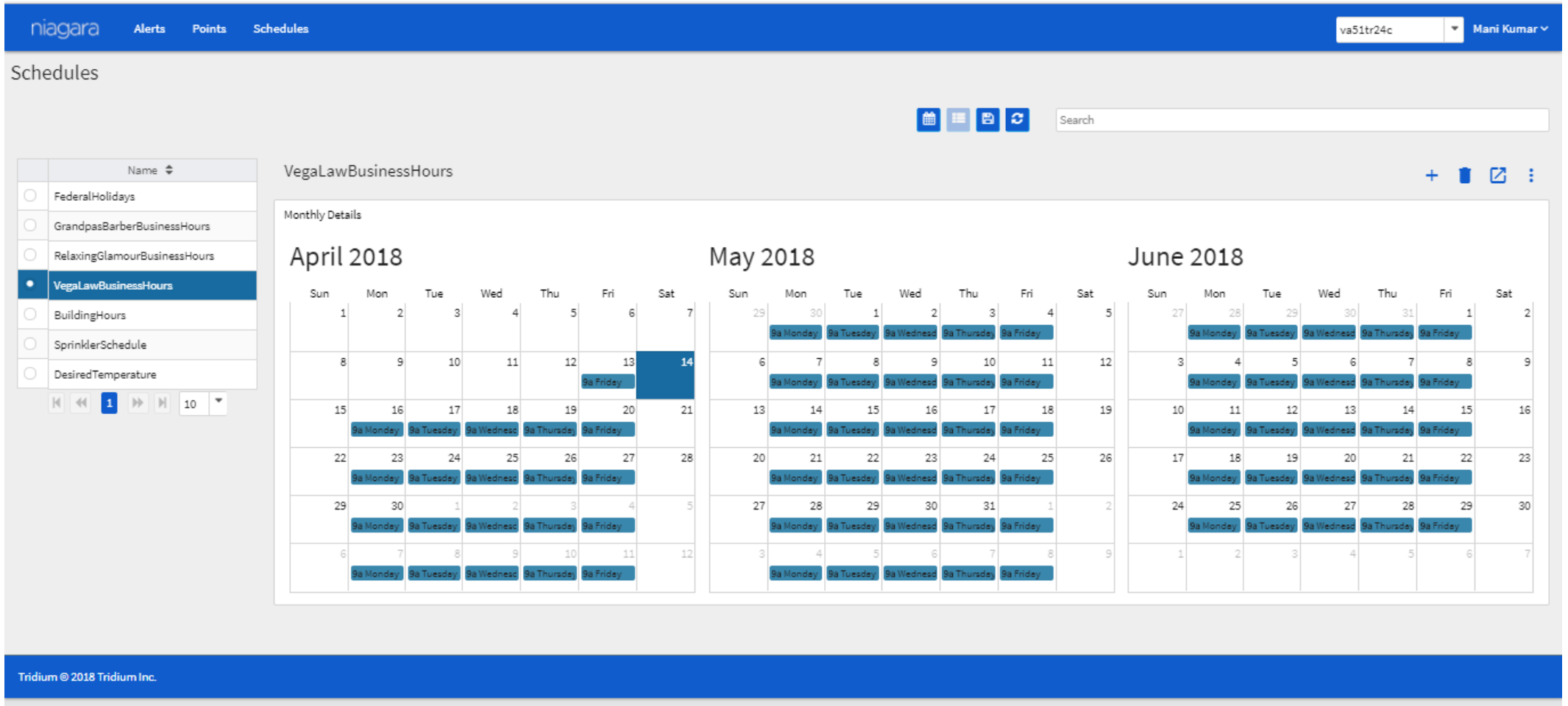
Niagara Cloud

Schedules



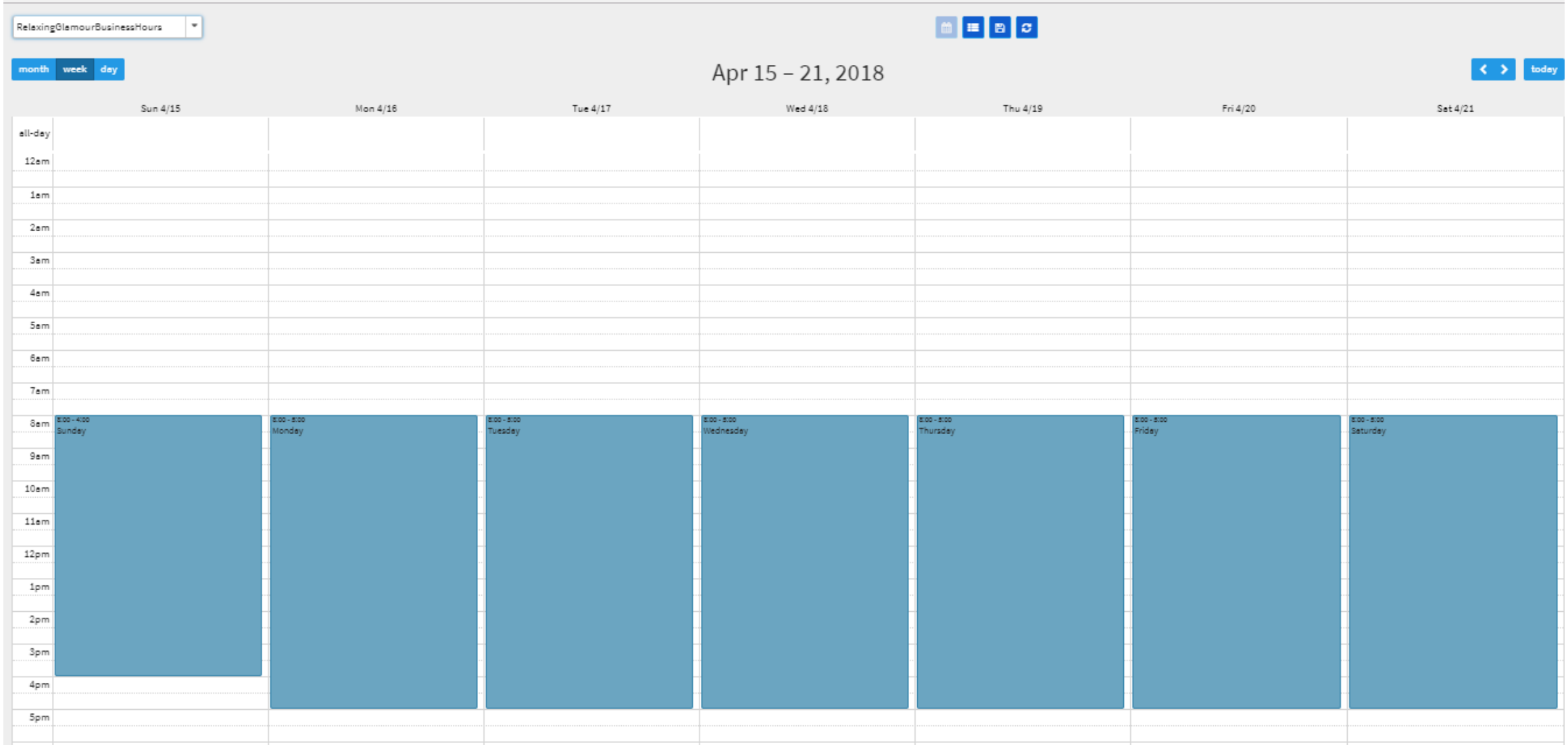
Niagara Cloud

Schedules



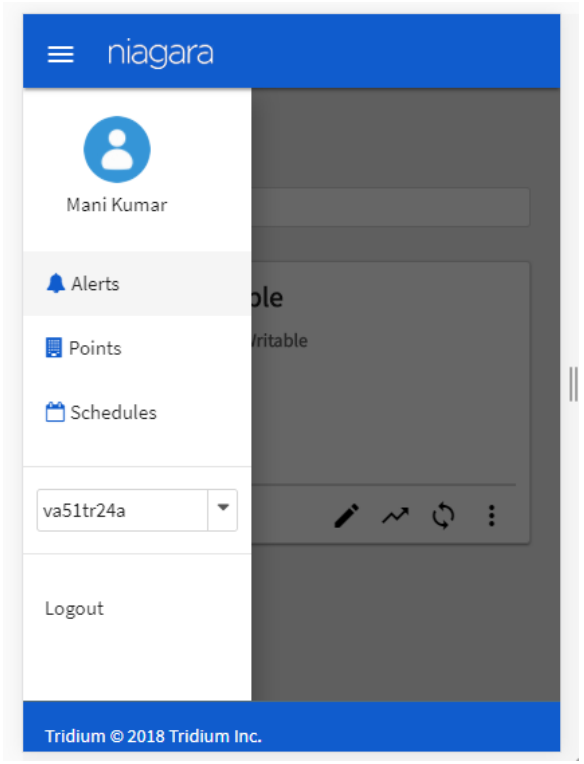
Niagara Cloud

Schedules



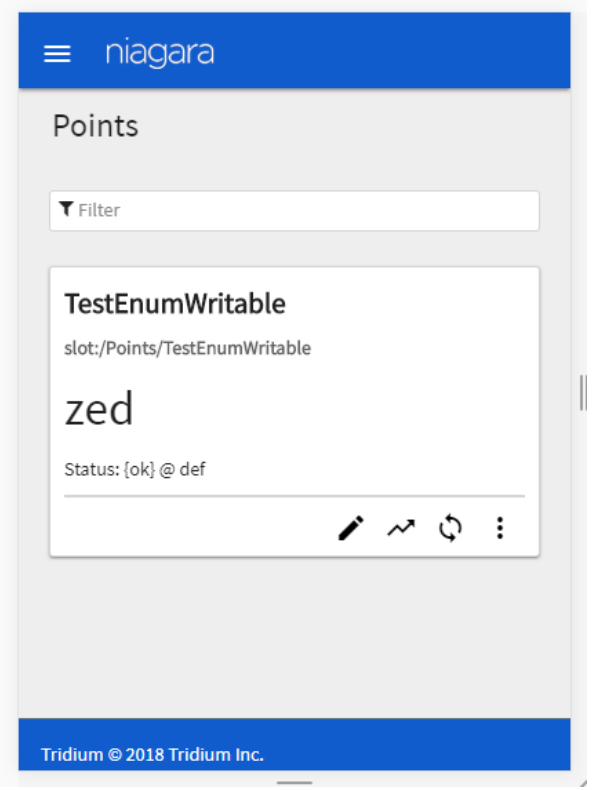
Niagara Cloud

Dashboard



Niagara Cloud

Points



Thank you

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