NODE4

Empowering business to do more

Azure Managed Service Overview

Service Overview

Node4's Azure Management & Support Services are designed for organisations that need a trusted partner to drive maximum value from Azure. Our team of experts work alongside our customers, providing a flexible service capability that covers everything from server patching, backup and monitoring to advanced DevOps and Governance Services. The below table shows a comparison of our service levels and features.

SERVICE FEATURES	Azure Starter Support	Azure Foundation Support	Azure Managed SysOps		
			Level 1	Level 2	Level 3
SUPPORT					
Support Hours	8x5	8x5	24x7x365	24x7x365	24x7x365
Technical support by phone, e-mail, or portal	E-mail Only	✓	✓	✓	✓
Premium support case escalation to Microsoft		✓	✓	✓	✓
Incident Management		✓	✓	✓	✓
Basic Azure Service Health Monitoring			✓	✓	✓
Azure IaaS VM Monitoring				✓	✓
Solution Level Monitoring (inc. PaaS services)					✓
Event Management			✓	✓	✓
Request Fulfilment			✓	✓	✓
OS level Monitoring (Windows & Linux)				✓	✓
Backup Management				✓	✓
Patch Management				✓	✓
IaaS Database Management (SQL Server & Oracle)				✓	✓
Azure SQL Performance Tuning					✓
GOVERNANCE					
Billing & Governance Portal				✓	✓
Access to the Azure Architecture team			✓	✓	✓
Cost Optimisation Advisory & volume discounts				✓	✓
Azure Policy Management				✓	✓
Quarterly Governance Review					✓
DEVOPS					
Access to Node4 IaC template repository			✓	✓	✓
Operability Improvement			Optional	Optional	✓
Infrastructure as Code (IaC) Management					✓
Deployment Management					✓

Azure Foundation Support

Azure Foundation Support is designed for customers who need minimal day to day support from Node4 either because they are yet to deploy production services or have considerable experience and resources in house.

Foundation Support provides Business Hours (8x5), Incident Management support, premium issue escalation to Microsoft plus management of SLA service issues with Microsoft:

Incident Management

Node4 operate a mature event and Incident Management methodology to sustain our solutions, enabling detection and management of issues. All service Incident lifecycle information can be viewed and tracked via our ServiceNow portal.

Events and Incidents are categorised by Impact Severity as follows:

Severity	Description
Level 1 - Critical	A major fault resulting in total loss of service.
Level 2 - High	A major fault resulting in a severe service degradation or loss of service to a significant percentage of users.
Level 3 - Medium	A minor fault resulting in a limited or degraded service or a single end user fault.
Level 4 - Low	General, non-service affecting support. This includes installation support.
Level 5 - Change Request	Level 5 should be used for requesting a change to an existing service or system.

Events and Incidents are handled under the following SLA:

Foundation Support

Action	P1	P2	P3	P4	P5
Faults & Technical Query Acknowledgement	1 Hr	1 Hr	2 Hrs	4 Hrs	1 Day
Remediation Actions Commence	2 Hrs	4 Hrs	8 Hrs	24Hrs	-

Note: Remediation actions may include escalation to Microsoft under the Node4 premium support agreement.

Azure Managed SysOps (Level 1)

Azure Managed SysOps – Level 1 is a service designed for customers who need access to a 24x7 support desk with an improved SLA, high-level monitoring of Azure “Service Health” issues and access to the Node4 engineering team for Architecture and Request Fulfilment services.

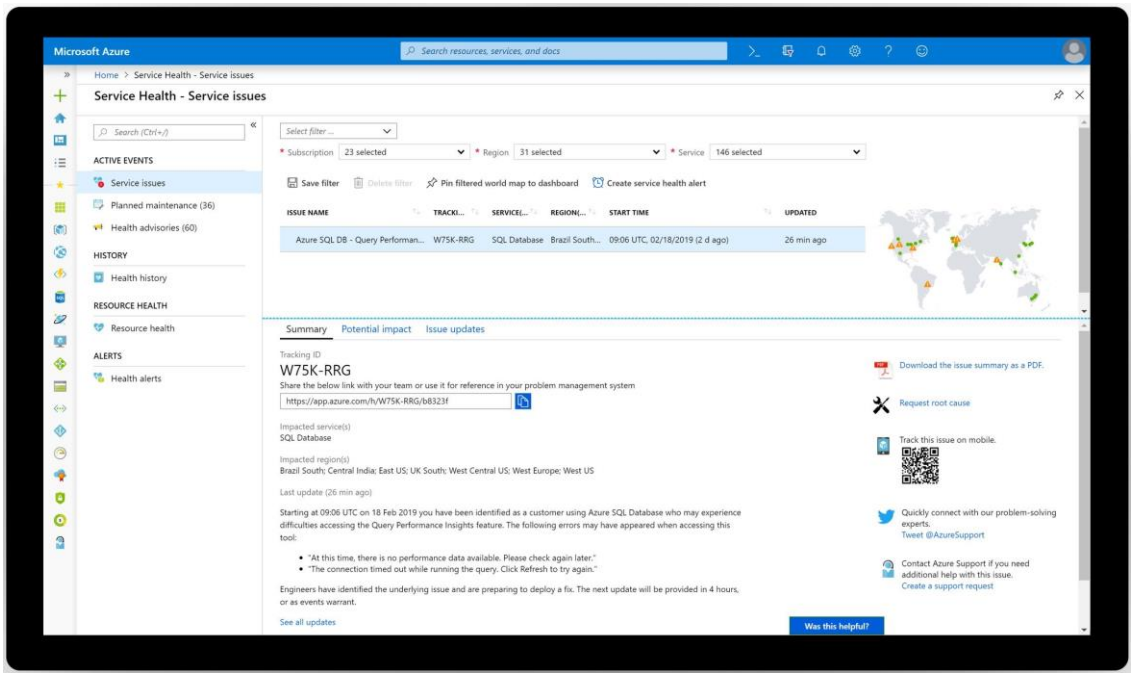
Managed SysOps Level 1 includes the key features of Foundation Support plus the following.

Improved Incident & Event Management SLA

Action	P1	P2	P3	P4	P5
Faults & Technical Query Acknowledgement	30 Mins	30 Mins	1 Hr	2 Hrs	1 Day
Remediation Actions Commence	1 Hr	2 Hrs	4 Hrs	12Hrs	-

Azure Service Health Monitoring

The Node4 Azure support team will be on hand to assist with any active incidents or health advisories as identified my Microsoft. Azure Service Health will be configured in the customers Azure environment to provide notifications on service issues and planned maintenance.



Request Fulfilment

The Request Fulfillment service module allows our customers to request service changes. We completely remove the need for our customers to have an in-house administrator. The below table provides an overview of the typically included service requests. Please note any Azure changes which require authorized provisioning of resources will require delegated rights (e.g., storage increases)

System Operations (Platform/ OS/ Network)

Request	Included
Azure Service Configuration Change	✓
Change/ Add/ Move Azure Storage	✓
Amend Azure VNet Configuration	✓
Reboot Azure IaaS VM	✓
Amend Instance Sizes	✓
Perform Azure Backup	✓
Verify a backup operation	✓
App Gateway Rule Change/ Add/ Delete	✓
Azure CSP Subscription Query / Resource Increase	✓

Architecture Guidance & Validation *(up to 4hrs per month consulting entitlement)*

Our architecture support service provides customers with access to our accredited Azure engineers who will provide hands on validation and design guidance for Azure deployments.

We understand that one of the main requirements of an infrastructure partner is to work closely with customers and external software vendors (where applicable) to help to define the optimal infrastructure and automation options for our customers applications. This will typically be based on several factors:

- The architecture and software used to build the application
- Predicted usage and access patterns of the application, and the anticipated requirement for planned or un-planned scalability
- Criticality of the application - what is the impact of downtime or unavailability?
- Ongoing support requirements post go live.
- Security requisites and any associated regulatory mandates which need to be adhered to (DPA, PCIDSS etc)
- Commercial impact of different environments.

Node4 have a track record of successfully delivering this level of consultancy, designing, deploying, and managing end-to-end infrastructure projects based on the output of these discovery exercises.

	Initial Discussion	Target Completion
AG & V Request	Next Working Day	With 5 Working Days

Please note.

- The initial discussion is estimated to take 30 minutes
- Monthly Hours entitlement cannot be rolled over

Our core design principles for Azure mirror Microsoft Best Practices:

- Design for self-healing. In a distributed system, failures happen. Design your application to be self- healing when failures occur.
- Make all things redundant. Build redundancy into your application, to avoid having single points of failure.
- Minimize coordination. Minimize coordination between application services to achieve scalability
- Design to scale out. Design your application so that it can scale horizontally, adding or removing new instances as demand requires.
- Partition around limits. Use partitioning to work around database, network, and compute limits.
- Design for operations. Design your application so that the operations team has the tools they need.
- Use managed services. When possible, use platform as a service (PaaS) rather than infrastructure as a service (IaaS).
- Use the best data store for the job. Pick the storage technology that is the best fit for your data and how it will be used.
- Design for evolution. All successful applications change over time. An evolutionary design is key for continuous innovation.
- Build for the needs of business. Every design decision must be justified by a business requirement.

Access to Node4 IaC template repository

Node4 Azure blueprints provide access to readymade best practice, reference architectures using Infrastructure-as-Code.

Over the years of working in Azure Node4 has built up a catalogue of templated IaC designs that meet Microsoft's "Cloud Adoption Framework" and "Well Architected" best practice standards. These templates are available for customers to use to accelerate best practice deployments and are built with Terraform. Examples of these include:

- Hub & Spoke Landing Zone
- Security Policies & Controls
- Windows Virtual Desktop
- Healthcare Landing Zone
- Sitecore Deployment
- Complex Azure Networking
- Bastion Services
- and many more

Azure Managed SysOps (Level 2)

Azure Managed SysOps – Level 2 is a service designed for customers who need advanced Governance services around cost optimisation and security policy management, plus monitoring and management of individual virtual machines, operating systems, and databases.

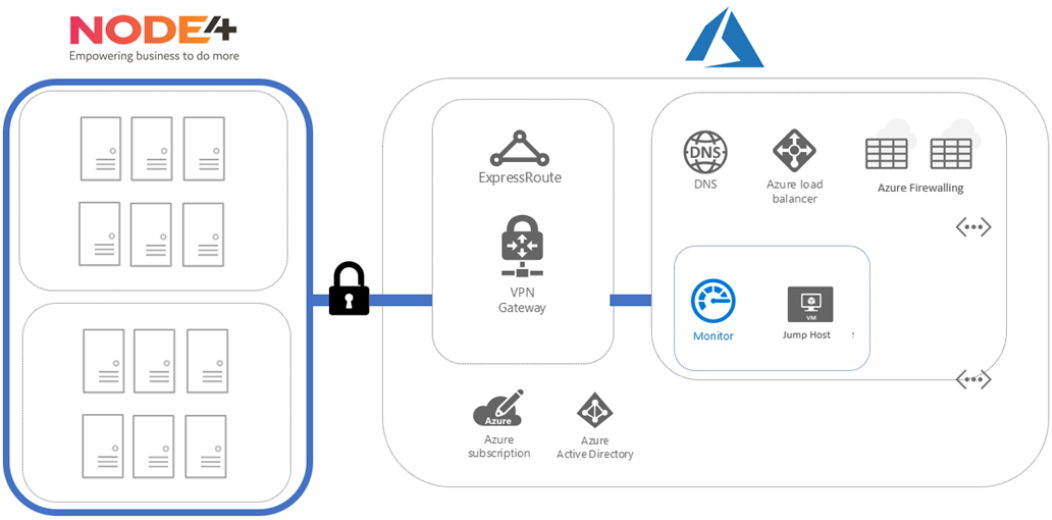
Managed SysOps Level 2 includes the key features of SysOps Level 1 plus the following.

Azure IaaS VM & Operating System Monitoring

The Node4 Intelligent monitoring solution allows for continuous monitoring of the Azure & Database components. The fully pro-active solution ensures that the environment remains optimised and that any issues can be identified, and appropriate action taken prior to the issues becoming business critical.

The monitoring services will be configured to automatically alert Node4 when any thresholds are breached thus offering a preventative support management service. The monitoring solution also allows for effective remote remedial action to be taken as all administration tasks can be delivered with speed and efficiency. Node4 will then remediate the Azure components based on the alerts received to ensure the systems always remain optimised.

Monitoring services will be configured to alert Node4 in-line with the requested SLAs for the supported components within the customer environment. The assessment of what SLA is applicable to the various instances will form part of the initial familiarisation work.



Monitoring Host Notes:

The monitoring service will connect from Node4 resilient DC's over an encrypted session. Node4 will require a dedicated monitoring host allocated in the Azure management network (recommended Standard_B2ms).

Backup Management

Node4 will provide a backup management service to maintain and improve the existing process where required. The service will handle any backup failures via the event/incident management process, and any restore request under the request fulfilment process.

The following services will be utilised:

- Azure IaaS Instances: **Azure Backup**

Example Retention Policy:

- Daily Backups – **7 Day Retention**
- Weekly Backup Point – **4 Week Retention**
- Monthly Backup Point – **12 Months**
- Yearly Backup Point – **1 Year**

Patch Management

The patching module is fundamental to achieving a secure and stable platform. With emergency patching to address security vulnerabilities being delivered via the Event & Incident Management service.

Operating System Patching (Monthly***)***

As part of the service Node4 will offer to patch Windows for the servers to be added, by default all Critical and Important patches released that month will be installed and the servers automatically rebooted for the installation of the patches to complete.

As part of the on-boarding process the customer will be required to identify and confirm the automatic schedule preferred for each server using the data capture form provided.

The patching process consists of the update being downloaded ahead of time. At the designated time scheduled the updates will install and the server(s) automatically reboot to complete the installation.

Database Management *(Optional)*

The Database Management service is an additional service which lets you tap the power of a team of experienced DBAs to remove the frustration, cost, and time of managing the day-to-day database maintenance yourself.

Operating 24x7, our multi-vendor DBA team is aligned to your business ensuring that your databases remain healthy and optimised. The Node4 DBA team are available to support the following technologies:

- SQL Server
- Oracle
- MySQL
- Couchbase

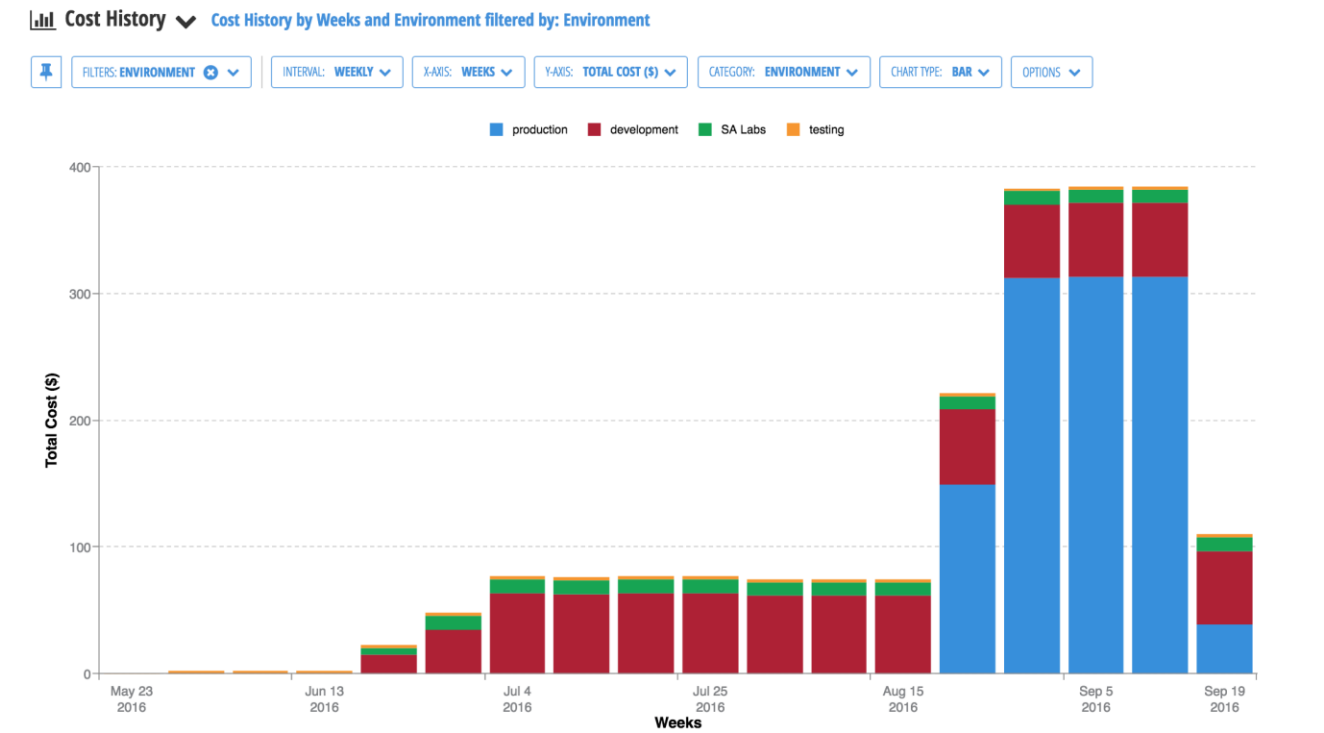
The Database Management service contains database aligned service capability for the following modules:

- 24x7 Monitoring using specialist DBA tools
- Incident & Event Management (access to DBA team 24x7)
- Request Fulfilment (DBA specific tasks)

- Back Up Management using our best practice scripts to offer granular data recovery points
- Patch Management on a quarterly schedule
- Performance Tuning

Cost Optimisation & Governance Tools

Node4 will provide access to our Billing Analytics Platform which provides customers with a wealth of information on Azure best practices including Cost Management, Right Sizing and Security Advisories. This analytics platform will continually review your deployment and feedback vital information to the management teams. This service can also integrate into the Node4 Service Desk team triggering and triaging alerts on spend threshold breaches and new advisories.



RECOMMENDATIONS > RIGHTSIZING > AZURE VM RIGHTSIZING BY INSTANCE

FILTERS | Search... | Edit Columns... | 25 Results Per Page | Period: September | Order: Decreasing

Found **16** Results

Total Score	CPU Score	Memory Score	Disk Score	Vm Name	Size Name	Region Name	Projected Compute Cost	Recommendation Savings	Recommendation
7	< 1	13	No Data	hinasql	Standard_DS1_v2	East US	$323.43	$316.17	Downgrade to Standard_A0
7	< 1	15	No Data	vkp-mswin-0623	Standard_A3	North Central US	$248.97	$161.42	Downgrade to Standard_A1
14	< 1	27	No Data	vkp-mswin623-eu	Standard_D1	West Europe	$136.04	$48.65	Downgrade to Standard_A1
13	1	30	7	agenttest	Basic_A1	East US	$30.43	$11.02	Downgrade to Standard_A0
38	3	73	No Data	agenttest-win	Basic_A1	East US	$51.16	$0.00	No recommended change
20	< 1	39	No Data	David-test-1	Basic_A0	West US	$12.41	$0.00	No recommended change

Cost Optimisation Advisory & Volume discounts

The Node4 Azure team will work with the customer to help identify cost optimisations through new architecture, services, incentives, reservations, and best practices.

As part of the agreement the customer will be provided with CSP subscription's from Node4 in line with the governance design which provides a greater level of flexibility and management than other methods. There is no upfront commitment like an Enterprise Agreement (EA) and the customer can benefit from discounts based on the consumption of services within Azure.

A CSP offers:

- True cloud pay-as-you-go economics
- Ability to license hybrid and cloud services
- Provides simple single bill that combines Support, Security, Management and Cloud
- Management of Microsoft relationship and administration of any SLA refunds
- Discount based on total consumption across Node4 CSP subscriptions

Monthly Commitment	Discount (%)
£0	0%
£10,000	2.5%
£25,000	5%
£50,000	7.5%

Azure Policy Management

Azure Policy helps to enforce organisational standards and to assess compliance at-scale. Through its compliance dashboard, it provides an aggregated view to evaluate the overall state of the environment, with the ability to drill down to the per-resource, per-policy granularity. It also helps to bring your resources to compliance through bulk remediation for existing resources and automatic remediation for new resources.

Common use cases for Azure Policy include implementing governance for resource consistency, regulatory compliance, security, cost, and management. The Node4 Azure team will advise and assist with ensure that appropriate Azure policies are deployed and any required change management in-life to meet new requirements or business demands.

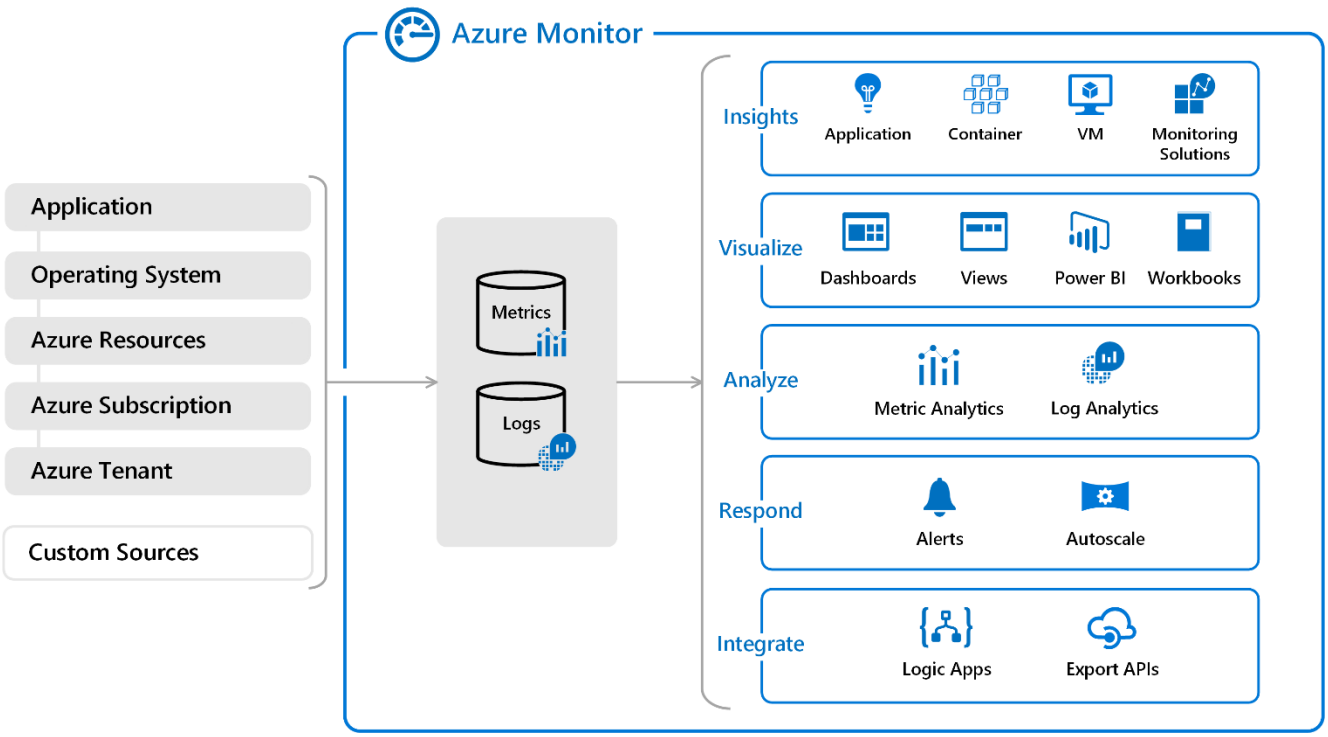
Azure Managed SysOps (Level 3)

Azure Managed SysOps – Level 3 is a service designed for customers who are running a mixture of Azure PaaS, Serverless and IaaS services and require a comprehensive 24x7 Managed Service. The Level 3 service incorporates our advanced DevOps & Governance capabilities as well as personalised monitoring, service management and performance services.

Managed SysOps Level 3 includes the key features of SysOps Level 2 plus the following.

Solution Level Monitoring

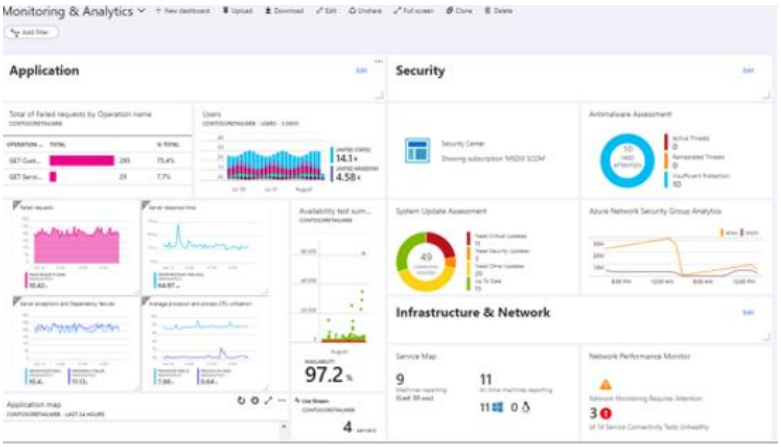
To achieve solution level monitoring covering the range of Azure native service the managed service typically leverages the embedded capability of the Azure Monitor services that will be deployed during on-boarding. Azure Monitor provides a highly resilient PaaS deployment that natively integrates with all Azure Services.



During the customer on-boarding phase we will agree the key metrics that represents the target operational goals. This should be completed through the stack capturing both Platform and Application goals across the below areas.

- **SLI's**: Service Level Indicators, this is a full list of all the metrics that need logging and retention.
- **SLO's**: Service Level Objectives are SLI's that have a target value or range which requires monitoring and breach alerting.
- **SLA's**: Service Level Agreements will be agreed on (no more than 3 SLO's). This will constitute the core contractual target.

The team will work with the customer to deploy shared dashboards, alerting and triage runbooks to ensure the effective monitoring of all solution components.



Please note, that although Azure Monitor is our standard approach, we recognise that as part of the broader agreement with Node4 there maybe existing tools that could be integrated for the independent VM's.

Azure SQL Performance Tuning (Quarterly)

Node4 provides a highly developed tuning and optimisation service to ensure Azure SQL databases remain available and performing to the optimum level. Our Database Administrator (DBA) team have many decades of experience in helping customers identify why databases are performing poorly which may include a multitude of considerations, from the service configuration, indexing strategy or query structure.

Quarterly Governance Review

The continued governance of the Azure environment is key to ensuring Best Practices are followed and audited. As part of this agreement Node4 will chair a quarterly governance review covering the below areas:

- **Azure Advisor Review:** Work through the advisories and agree actionable items
- **Cost Management:** A review of the optimisation tools and recommendations for controlling spend
- **Security Centre:** Check compliance to required standards and review current security posture
- **Identity Management:** Review of management groups, RBAC and identity controls
- **Policy:** Check policies are effective and representative of required controls
- **Resource Consistency:** Review tagging, naming and agreed standards are consistent across projects
- **Deployment Acceleration:** Discuss current deployment approaches and review improvement areas
- **Operability Improvements:** Keep track of improvement actions and tasks

Operability Improvement *(Monthly Consulting Entitlement)*

Operability of the system must be treated as a "first class" priority and a shared responsibility between the Node4 and the customer development teams.

Operability Improvement will be focussed on improving the following areas at both the Application and Infrastructure levels.

- Availability
- Performance
- Scalability

- Security
- Recoverability
- Business Continuity
- Deployment
- Monitoring
- Logging & Metrics

Metrics and Logging

To seek improvement areas and evidence the rationale it is important that the team has access to a rich set of metrics and logs. The managed service encourages the use of the Azure native service such and Log Analytics and Insights to provide shared information that both teams can use as a single source.

Infrastructure as Code (IaC) Management *(Monthly Consulting Entitlement)*

An IaC model is our preferred default for customers and the Node4 DevOps team will lead on the management and definition of the IaC scripts however, via the release management process the customer will be able to make configuration changes and contribute in-life.

Our DevOps team will leverage services within Azure and typically use a combination of Terraform and Ansible to build new automated workflows.

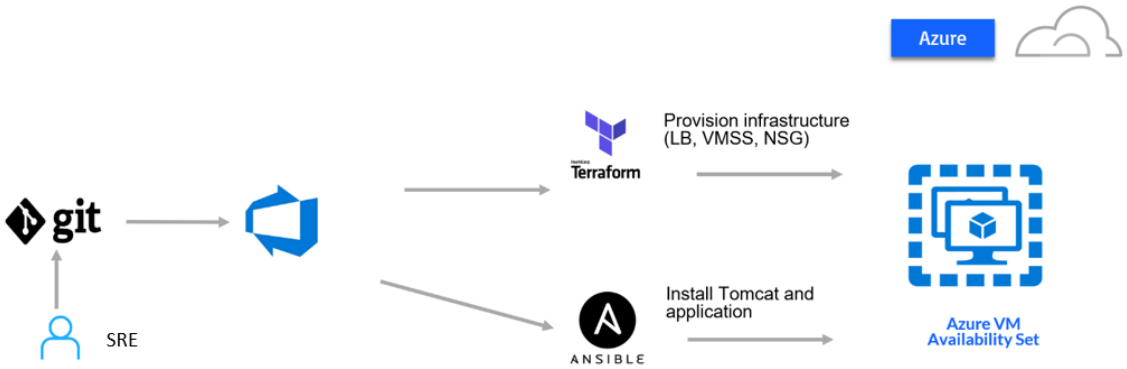
Deployment Management

Node4 will work with the customer to ensure there is a consistent and effective release management approach in place. A key part of the Managed Service is the desire to remove the need to undertake manual changes to the service configuration outside of agreed releases. Therefore, all changes are made via the configuration files and pushed through an agreed deployment pipeline with agreed automated testing.

Deployment Tool Chain

The Node4 Azure Managed Service prefers the use of Azure DevOps to define and “manage” the deployment process. Typically, the team will use a mixture of Terraform, Ansible and ARM templates to support the infrastructure side and customers commonly also integrate tools such as Jenkins and Octopus. In addition, Azure DevOps provides a shared space to collaborate and accommodate shared working on releases.

Image showing a simple example of the toolchain for an Infrastructure Deployment



The release process will depend on the application and customer requirements; however, we encourage customers to consider lower risk strategies such as blue/green and/or canary deployments.