Prodapt powering global telecom

Speed-up entertainment services rollout

Implementing an effective CI/CD setup to deliver high-value media services with agility

Credits

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Fast-track rollout of NextGen media services – Need of the hour

Rapidly changing landscape of consumer video consumption

78.4%

of digital video viewers in 2018 to use mobile phones to watch digitally streamed content - eMarketer

85%

of US internet users watched online video content on any device as of Jan 2018 - Statista

$792.3B

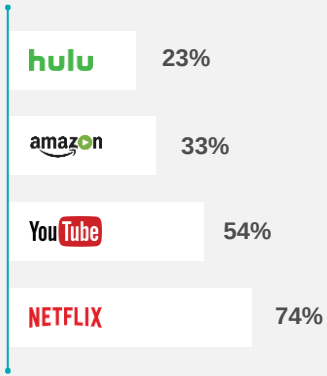
US Media & Entertainment revenue by 2022. CAGR increase by 3.5% - PwC

84 mins

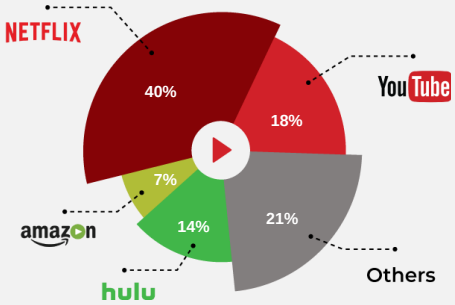
Average daily time spent in watching online video by 2020. Increase by 25% from 2018 - Statista

An effective CI/CD approach enables DSPs to achieve same innovative services and delivery agility that OTT providers are offering to stay competitive!

Penetration of US OTT households



Share of total OTT viewing hours



Source: comScore (April 2017)

To capture this growing demand of online media consumption, it is very critical for DSPs to deliver **fast-track rollout of NextGen media services.** Further, to counter the growing influence of OTTs, DSPs must deliver **high quality, right first time and consistently right media** services along with creating competitive advantage through speed to market.

Unlike OTT players, DSPs have been limited by extremely long development and roll-out timelines for new services and offerings. Primarily because of enormous amount of vendor specific hardware and software applications that do not support rapid changes.

Adopting an effective CI/CD for NextGen media landscape is easy…in theory!

Requires end-to-end CI/CD orchestration, which is operationally complex

Complexity in stitching together different types of video services

- Live TV Streaming
- Video on Demand (VoD)
- Electronic Program Guide (EPG)
- 4K/HDR
- User Personalization & Profiling

Catering to Diverse Landscape

- Rollouts in multiple geographic location and multiple tenant environment
- Catering to multiple vendors
- Providing multilingual support
- Availability in multiple time zones

Dynamic pushing of new content

- Handling 1000+ live TV channels
- Thousands of VoD samples
- Contents coming from various sources
- Inter-connecting various nodes & clusters
- Transmuxing right audio files & subtitles

Seamless viewing experience across platforms

- TV, Mobile, Tablets
- Android / iOS/ Windows
- Desktop, Set-Top Box
- Interconnecting local & central components
- Bridging legacy systems with modern architecture

Cross-functional & cross-geographic teams, owning different parts of the process creates gaps in design, infra setup, configurations & eventually deployment.

While pipelines could be created, it may not work accurately every time or for every tenant leading to failures and lot of troubleshooting.

Requires navigating through different techno-functional complexities.

- Content Sourcing
- Content Transcoding
- Catalog Creation
- Content Ingestion
- Meta Data Processing
- Content Delivery

across different networks & bandwidth

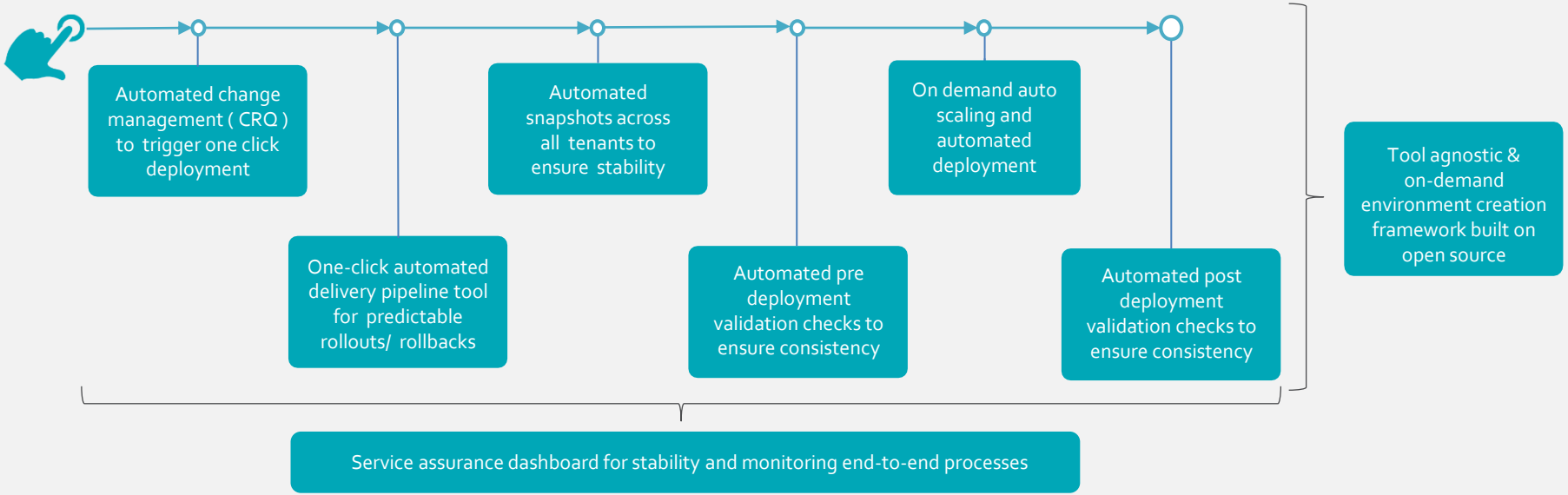
DSPs need to ensure below characteristics for effective CI/CD setup

- Fully automated deployments
- Easy to operate & visualize
- Consistently accurate
- Remotely controlled
- Simple & transparent
- Optimized Cost

Running a right first time and consistently right media delivery landscape in this context can be a costly affair and yet not effective.

Key enablers to automate CI/CD workflow making it highly efficient

Embracing these key enablers in fully automated delivery pipeline can help DSPs in setting up effective CI/CD



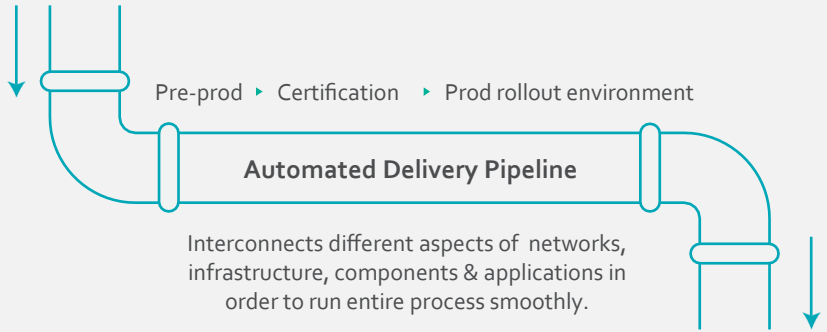
The One-click automated pipeline tool should be integrated with above enablers to provide end-to-end automated rollout of media services.

Key enablers to set up effective CI/CD

1) One-click automated delivery pipeline tool for predictable rollouts/rollbacks

One-click automated delivery pipeline can facilitate automated change management CRQ triggers towards initiating CI/CD jobs. This triggers the entire deployment of all the app components in the respective tenants across multiple geographic location.

Configure parameters based on app/environment/tenant.
Get trigger from CRQ approvals.



Interconnects different aspects of networks, infrastructure, components & applications in order to run entire process smoothly.

Automatically rolls out/rolls back respective components and their infra/network changes at given tenants.

- Track CRQ approvals over systems like JIRA to trigger automations in the delivery pipeline.
- Build pipeline as a code with intermediate CI/CD stages using open source tools like Jenkins.
- Design a master job to accept component & configuration details. This performs multi-job configuration & triggers contextual deployment/ rollback simultaneously across tenants.
- Build customized scripts for pre-/post-processes such as snapshots, prerequisites, validations to ensure end to end accuracy

Advantages

- Makes it seamless and simple to operate a complex multi-tenanted multi-geographic pipeline
- Provides greater accuracy and predictability reducing the human error factor
- Provides seamless transition from change request (CRQ) to change implementation

Key enablers to set up effective CI/CD

2) Automated pre-checks, pre-steps and post-validation scripts to ensure consistency

Automated Snapshots before deploying the new version of application facilitates rollback if any failure occurs. Automated multiple validation at every deployment stage is necessary to maintain consistency at any given time.

Automated snapshots

Snapshot management process needs to be fully automated

- **Creation**
- **Rollback**
- **Deletion**

It can be included in one-click delivery tool & tracked via the monitoring dashboard

Automated pre-checks and post validations

- ✓ Network connectivity
- ✓ License file validation
- ✓ Binary file size
- ✓ Configuration files
- ✓ Network consistency
- ✓ Memory usage and CPU utilization
- ✓ Application validation
- ✓ Automated sanity of E2E stack
- ✓ Error & debug log file validation

Validation enablers

Groovy, Ansible, Shell Scripting, python, Jenkins

Validations can be done via these scripts with the proper libraries that match industry standards.

Advantages

- Gives flexibility to find root cause and quickly rollback to previous consistent version with zero downtime
- Adds agility to CI/CD process while maintaining stability in the ecosystem
- Significantly improves the efficiency of the CI/CD process towards more predictable outcomes, especially in multi-tenanted deployment landscape

Key enablers to set up effective CI/CD

3) Auto-scaling tool to optimize resource usage

Integrate the Auto scaling tool with CRQ process and predictive machine learning models to handle dynamic scaling up/down of infrastructure.

- **Identify and analyse system throughput -** Analyze external factors such as number of users, volume of transactions, hits, and content served. Also include internal factors such as available memory and processing capacity.
- **Auto-manage changes in current payloads and traffic** - Insights from service assurance dashboard can be leveraged to create auto-scaling of current client landscape.
- **Derive predictive analysis** - Triggers from ML model can be leveraged to plan future expected throughput of the systems translating to CRQs.
- **Support "Infrastructure as a software"** - Automated configurable scripts can support auto-scaling, based on triggers form CRQs. This automatically deploys VMs, storage, pods in required corresponding applications.

Advantages

- **Better availability** - Ensures that application always has the right amount of capacity to handle current traffic demand
- **Better cost management** – Enables launching instances when they are actually needed and terminating when they aren't
- **Better fault tolerance** - Detects when an instance is unhealthy, terminates it, and launches an instance to replace it

4) Tool agnostic and on-demand environment creation framework built on open source

Leveraging open source tools gives flexibility & control over entire E2E deployment process

Customized framework

Using customized framework with layered approach makes the delivery pipeline tool agnostic. It gives flexibility to easily replace/plug-in any tools in the DevOps chain without much dependency.

Predominantly used opensource tools

docker ANSIBLE Jenkins

Tool for managing docker container

kubernetes

The Jenkins slaves customized as docker containers can be provisioned at run time based on the deployment job request.

Advantages

- Increased reusability – Same toolchain can be used for multiple environments (prod, pre-prod)
- Customized framework dynamically handles the resources and utilizes the infrastructure effectively

Key enablers to set up effective CI/CD

5) Service assurance dashboard for stability and monitoring end-to-end processes

Provides glimpse of entire end-to-end CI/CD performance in a single window. Can also provide real-time graphical insight into failures/blockages in the pipeline, highlighted in the context of the overall flow.

Monitoring key processes

Build a customized media service assurance dashboard that provides below mentioned key features.

- Fetches data from the deployment pipeline for respective components dynamically
- Monitors how the upgrade/rollouts are processing
- Provides insight into resource usage which triggers dynamic auto-scaling
- Gives visual comparison of previous firmware with the new one
- Also derive insights into stability of key processes in the ecosystem post deployment

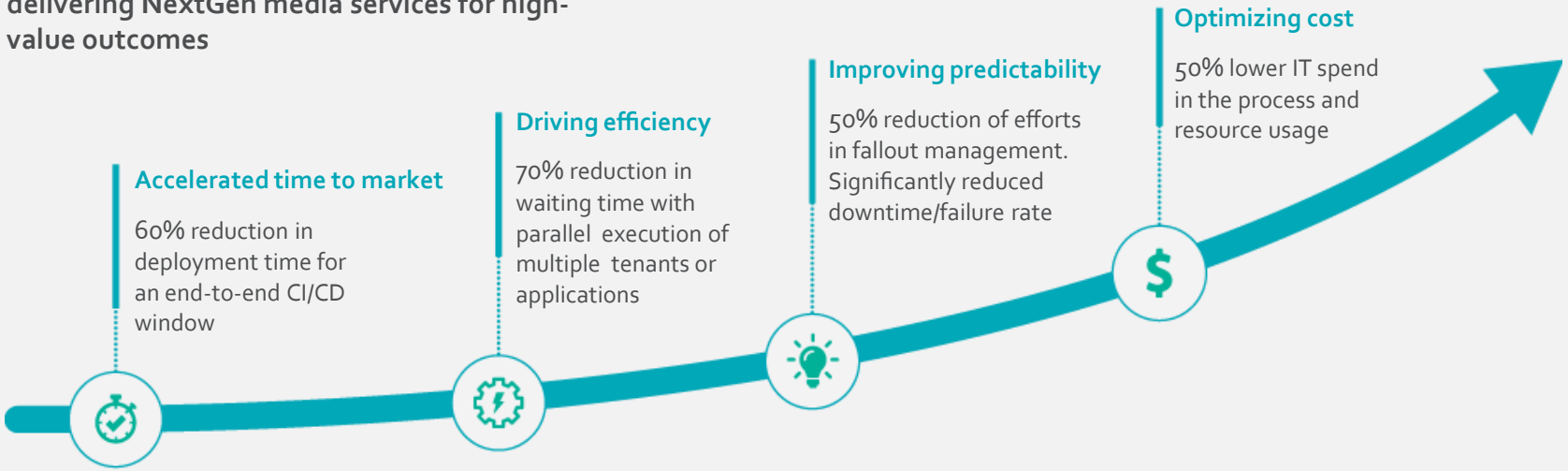
Advantages

- Greater visibility
- Easy diagnosis
- Error prevention

Pipeline as code stability with comparison across versions

Business & operational benefits

Driving agility, efficiency & predictability in delivering NextGen media services for high-value outcomes



Faster rollouts of new content and features, enhances customer loyalty to the brand, leading to long term relationships.

- Quick adoption to rapidly changing customer needs
- Improved customer satisfaction
- Improved service quality & reliable releases
- Long-term structural improvement of NPS

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THANK YOU!