
sky
Streaming in the Land of Containers
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Streaming Forum London, 27/2/18
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# Every journey starts with a single step

**Sky is one of the leading commercial TV operators in Europe, operating in six countries with a high value portfolio of premium content. In this presentation we will cover;**

- Why we are moving our video workflow from appliances to containers?
- Describe the benefits of containerisation for live streaming?
- How we merged two different worlds to create Streaming DevOps?
- What we learned on our journey?
- Where are we going next?



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# We needed a new faster approach to deliver channels

**Previous live streaming platform delivery timescales (Streaming perspective)**

- Typical time required to stand up a new live streaming channel = Up to 4 weeks.
  - Stream configuration, testing and launch = 3-4 weeks.
- Additional costs due to project timescales and risk with manual channel build.




**New live streaming platform delivery timescales (Streaming perspective)**

- Spins up new live channels quickly (Assumes compute available).
- Each channel is consistently built using templates.
- Channels can be modified quickly by updating templates.
- Modular architecture provides flexibility to adapt to future needs.
- Supports new streaming capabilities such as Ad-hoc resilient channels.



**Our new Software Defined Streaming platform puts us in the fast lane**

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# Old versus New

**Pets (Appliances) – Streaming Engineers**

- Pets create a strong emotional connection.
- We invest a lot of time to nurture and train them.
- We get upset when they are ill and take them to the vet to get better.



**Cattle (Containers) – DevOps Engineering**

- Farmers are running a business and do not get emotionally attached.
- Use new machinery and procedures to cut costs or increase revenue.
- When a cow gets ill, it is culled from the farm, as the farmer is focused on the herd.



**Streaming DevOps is the merging of two skill sets to optimize the video workflow**

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# What is Software Defined Streaming (aka SDS)?

**A reimagining of live streaming using Streaming DevOps to deliver;**




- Introduction of Reduced Fault Domain.
- Resource planning and capacity planning on a per channel basis.
- Continuous Deployment and Continuous Integration (CI/CD) automation pipeline.
- Automated video and audio quality monitoring.
- Centralised monitoring and aggregation reporting using open source tools Elasticsearch, Logstash and Kibana.

**All whilst maintaining…**

- Existing high quality streaming services for client devices.

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# What is the Reduced Fault Domain?

**A fresh approach to how we deliver live streaming;**




- SDS allows us to reduce the fault domain and protect channels and is much simpler with containers than with appliances.
- The ability to recover channels whilst not affecting other channels.
- End to End automated deployment of channels and lights out recovery in the event of disaster.
- The same software stack can be deployed on or off premise, further reducing risk and support.
- Version control of channel configurations using software engineering best practices.

**Our business is about providing customers with a great streaming experience.**

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# SDS is a multi layered approach to live streaming

**Where possible be open to using the right tools for the job**

- Docker is our container engine.
- Kubernetes for orchestration of containers.
- Prometheus to provide container metrics.
- Jenkins for continuous integration and delivery.
- ELK stack for Search, Log aggregation and Visualisation.
- Grafana for creating dashboards.

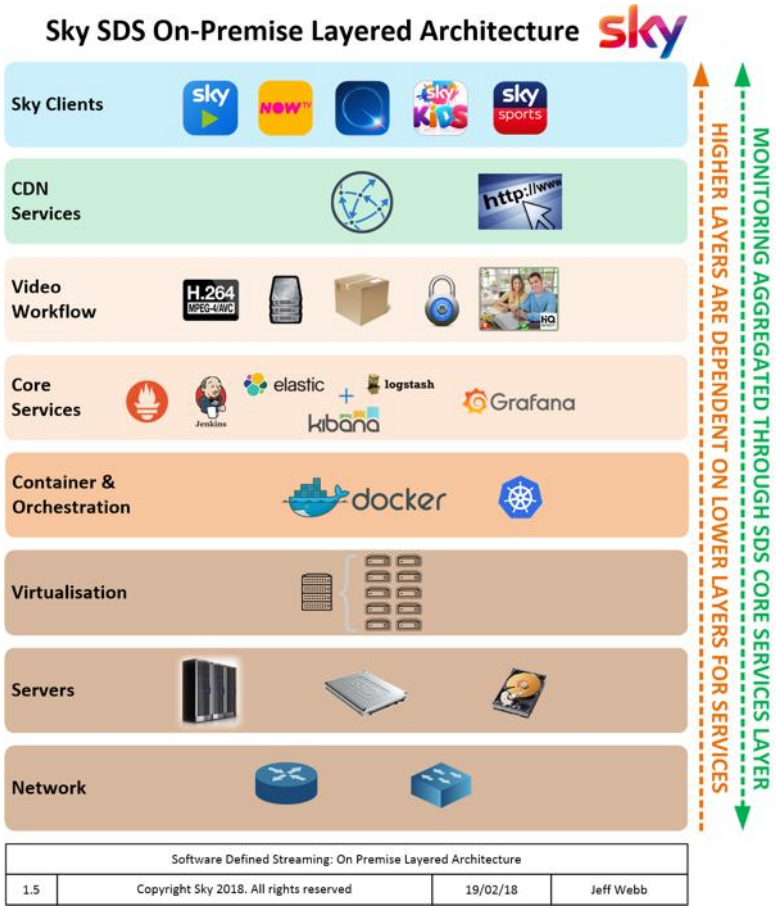


**Some of the benefits of containers over appliances include;**

- Lightweight footprint makes efficient use of the available compute.
- Very fast application startup time.
- Consistency of channels with automation pipeline.

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# SDS Layered On-Premise Architecture




| Software Defined Streaming: On Premise Layered Architecture | | | |
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# How do modern operations teams benefit from SDS?

**SDS introduces software engineering best practices for live streaming consistency**



- Driving towards a single pane of glass for monitoring the end to end video workflow.
- Centralised data collection from multiple sources.
- Correlated platform metrics available on a per channel basis.
- Increased end to end stream visibility to drive down fault resolution time.
- Automation pipeline reduces operational risk through automated tests in non-production.
- Change control improvements through increased predictability and confidence.
- Release schedule is structured so that nothing can be released to production without human intervention.

**You cannot manage what you cannot measure, so we make sure we have lots of relevant data**

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# How could the cloud benefit Sky?

**SDS is designed for deployment anywhere**

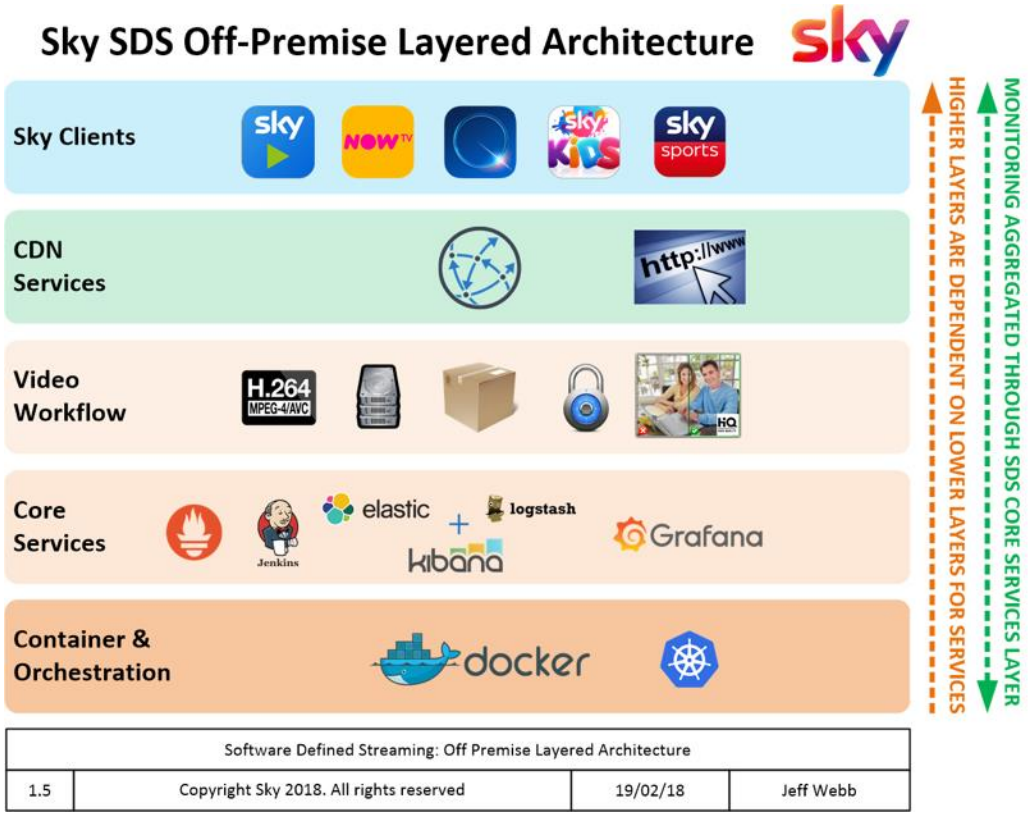
- Infrastructure agnostic architecture.
- The same software stack can be deployed either on or off premise.
- Flexible and consistent installation across different geographies.
- Ability to support video ingest to the cloud from multiple locations.
- Shortens the development cycle by not having to wait for infrastructure.



**SDS allows us to rapidly respond to our business needs**

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# SDS Layered Off-Premise Architecture




| Software Defined Streaming: Off Premise Layered Architecture | | | |
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# What we have learned so far on our SDS journey?

**You have to be committed (pun intended) to Streaming DevOps**

- Tight collaboration between streaming engineers and DevOps engineering.
- Migration from pets to cattle, required a cultural mind shift change.
- Streaming DevOps is a cultural collaboration and brings best of both worlds.
- Engineers now have time for research & development to enhance our services.
- Synergistic relationship with the whole being greater than the sum of its parts.

**You need to be able to see the whole forest and not just the trees.**





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# Where are we going next?

**Future plans include**

- Further improvements in our end to end monitoring visibility.
- Explore Machine Learning opportunities.
- Explore new compression technologies.

**The technology landscape is vast and ever changing, standing still is the greatest risk a business can face, so we must adapt or be passed by our competition.**



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# Thank You

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