



# Telenor CDN - overview

Juni 2022

# Content Delivery Network

- Telenor CDN – Key Insights
- Network Connectivity
- Value Chain
- Products
- Service level
- Statistics
- Price model
- Summery



# Content Delivery Network by Telenor

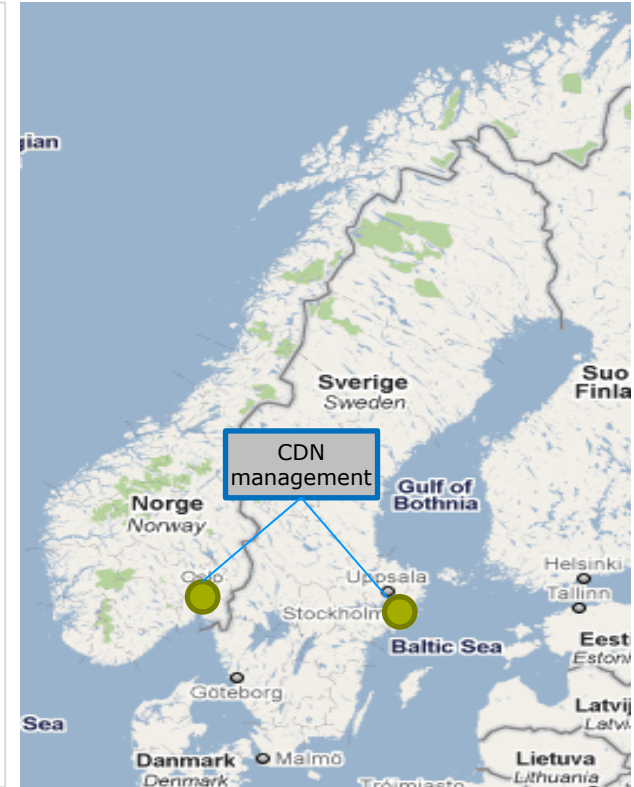


- High capacity and scaling of content distribution to end customers on the Internet
- Quality that meets customer needs
- Competitive and flexible supplier with local presence and accessibility for our customers

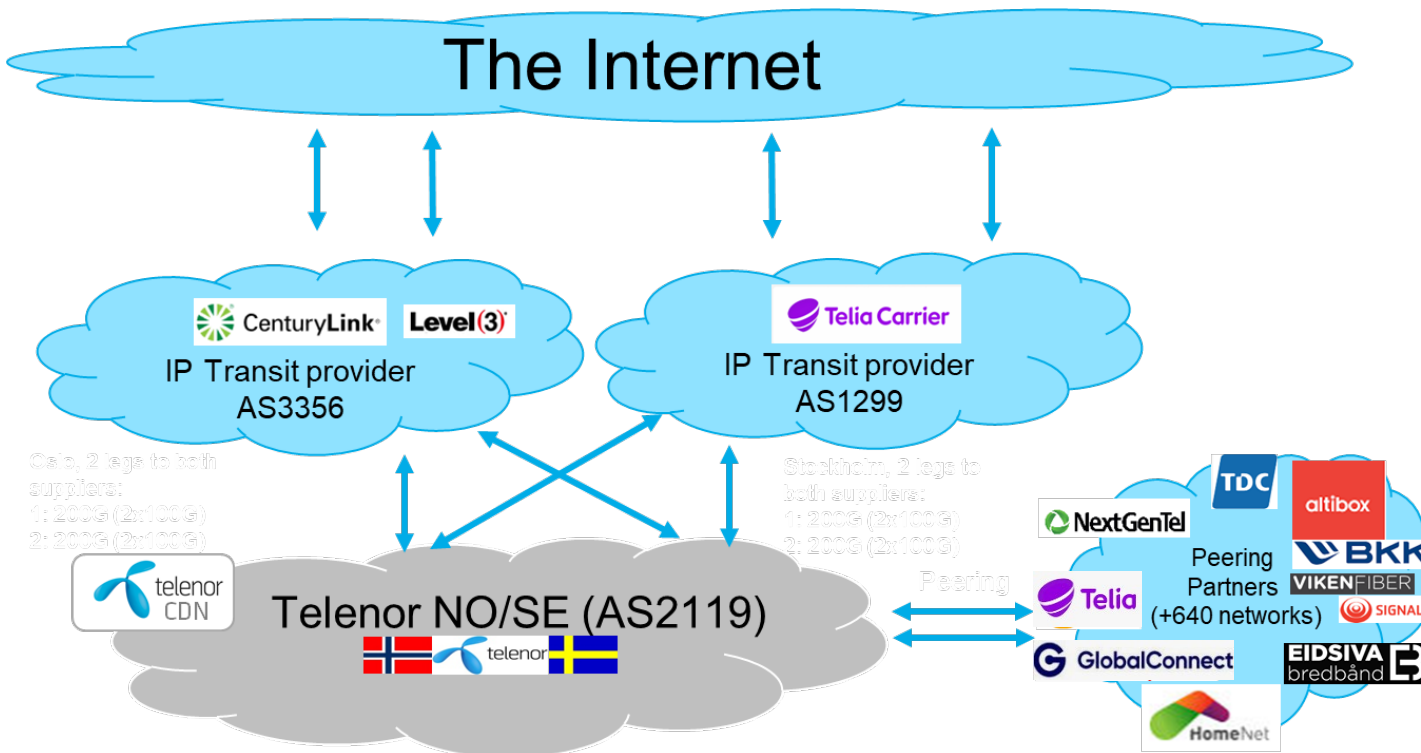


# Telenor CDN – Key Insight

- Supports Internet TV-streaming and content distribution
  - Multi-screen/-device streaming for PC and MAC-clients, STBs, tablets, gaming consoles, mobile phones and Smart TVs
- Supporting formats: MS Smooth Streaming, Apple HLS, Adobe Dynamic Streaming (HDS), DASH and Icecast (radio) and more.
- Security – supports SSL and the CDN platform is secured by the functionalities that is part of Telenor's IP-network.
- CDN Portal for self service and APIs and supports geo-blocking, purge and live statistics
- Origin integrated with head end serving more than 190 live TV-channels and on demand origin with capacity to store large volumes
- CMS and player neutral. Experience to serve different CMS/asset management
- A high-capacity platform for streaming/caching that scales with Telenor's core network, including peering and IP transit arrangements
- The playout-capacity is about 2400 Gbps and expands according to traffic grow
- High uptime - based on redundant platform with global load balancing



# Telenor's IP-network and Connectivity



# Telenor CDN – products

## Distribution – basic products

- Streaming/caching live and on demand
- Includes
  - Standard statistics (real time and historical)

## Distribution – add on

- Geoblocking
- Security, SSL
- Monitoring tools



## Content Origin – add on products

### Live Content Origin

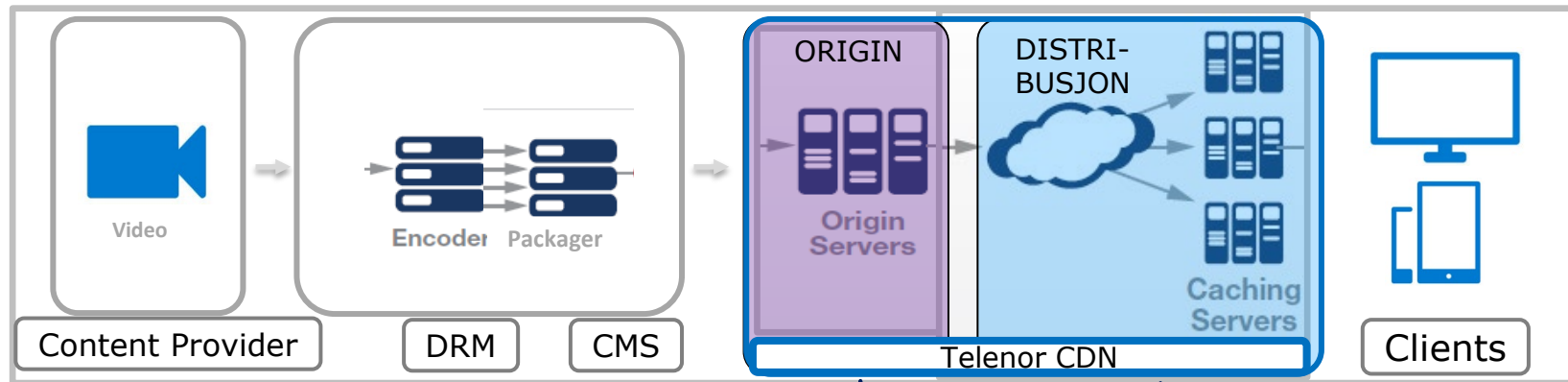
- Publishing point – live channels
- Live buffer and DVR
- JiT formatting – layout
- Archive

### On demand content origin – Storage

- On Demand Content Origin
- Origin shield. Dedicated origin caching (when remote origin)
- FTP-account for download of content
- JiT formatting – layout



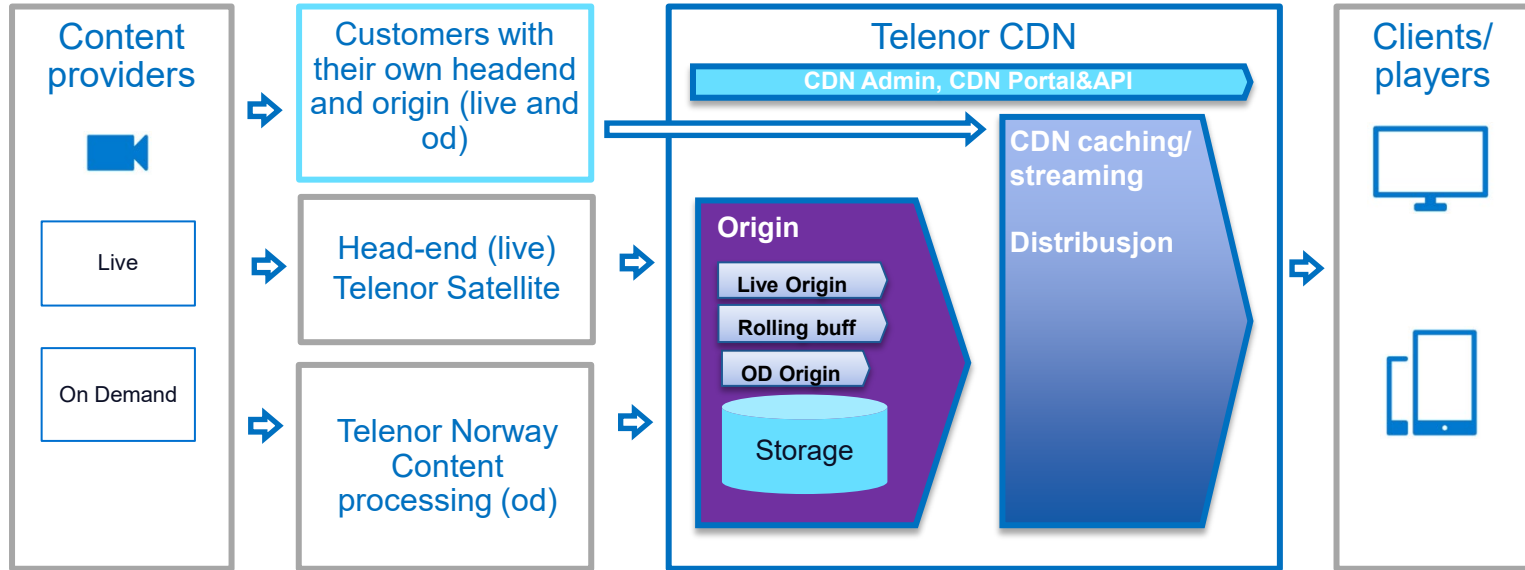
# Telenor CDN – Workflows and Products



CONTENT ORIGIN - LIVE						CONTENT ORIGIN - ON DEMAND		DISTRIBUTION	
Publishing Points	Live buffer - DVR	Origin Shield	Storage	JIT Formatting	Archive			Caching – live og OD, inkluderer - Statistics live and history - Additional: SSL og Geo-blocking	
Origin products								CDN Distribution	



# Streaming workflows and options

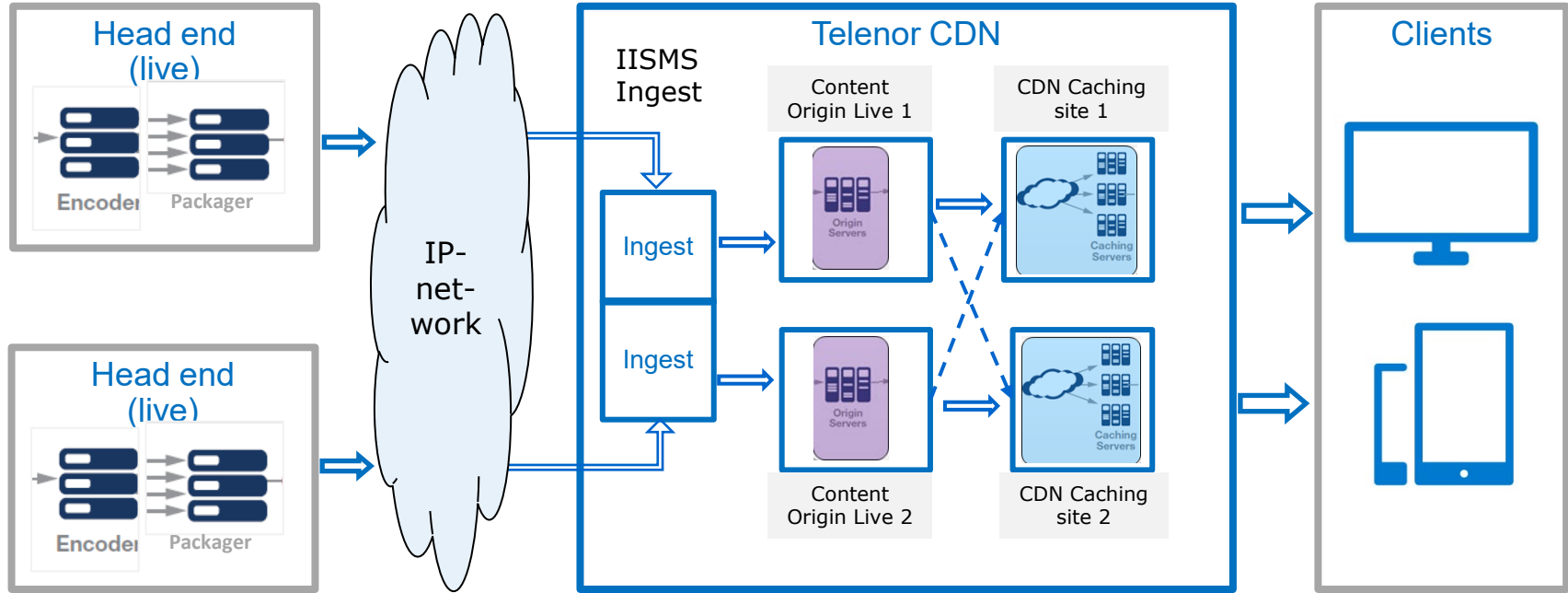


- Content Production – highly automated and efficient processing of assets

- High Capacity CDN - 2400 Gbps
- High degree of redundancy – several datacenters
- Uptime near 100%, measured over the last 24 months



# Telenor - Content Delivery Network – integration headend



Input requirement:

- Format HSS
- Push

Other setups to be discussed



# Telenor CDN – service level

SLA-structure for CDN				
Product name	Uptime (Availability)	Hours down (per month)	Correction time Level 1–4	Troubleshooting
Telenor CDN	99,90 %	43 min 49 sek	Own table	All days 00:00 – 24:00

Period for measurement per month

**The Service is expected to be in operation and available 24 hours, 365 days in a year**

- Highly redundant solutions – high degree of security
- Telenor has defined the time from Monday at 01:00 to 06:00 as a general maintenance window. At this time, there may be a reduced service quality throughout the Supplier's network.

If the guaranteed uptime is not met → compensation

# Telenor CDN Portal for self service and API's



<CUSTOMER>

Now

4.37 Gb/s  
10.6% / hour ↗

1.55k conns.  
5.3% / hour ↗

596.88 hits/s  
7.2% / hour ↗

OVERVIEW

STATISTICS

PURGE

API

Statistics

Status

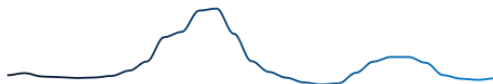
Contact

User

## Realtime - overall

Now 4.37 Gb/s  
10.6% / hour ↗

Peak 23.15 Gb/s



Traffic (b/s) last 28 hours

Now 1.55k conns.  
5.3% / hour ↗

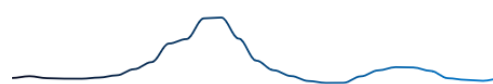
Peak 8.55k conns.



Connections last 28 hours

Now 596.88 hits/s  
7.2% / hour ↗

Peak 2.92k hits/s



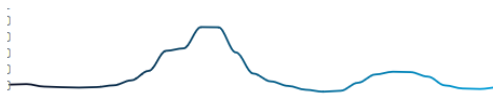
Hits/s last 28 hours

## Realtime - account types

Live

Now 3.95 Gb/s  
13.6% / hour ↗

Peak 19.33 Gb/s



Live traffic (b/s) last 28 hours

On demand

Now 377.95 Mb/s  
-1.8% / hour ↘

Peak 2.02 Gb/s

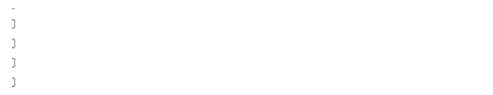


On demand traffic (b/s) last 28 hours

Static

Now 0 kb/s  
0.0% / hour →

Peak 0 kb/s



Static traffic (b/s) last 28 hours



# Telenor CDN – Uptime and Response Time



2021-03-22 09:26:07 (GMT +01:00)  
The shown time zone is the same as yours

Telenor CDN (Mar 2021)

Telenor CDN

Recent

History



Last checked  
2021-03-22 09:21:40

Uptime this month  
99,81%

Avg. resp. time this month  
36 ms

Check type: TCP Port  
Check resolution: 5 minutes

Name ▼

Uptime

Response Time

March 2021

99,81%

36 ms

February 2021

100%

38 ms

January 2021

100%

43 ms

December 2020

100%

37 ms

November 2020

100%

35 ms

October 2020

100%

37 ms

September 2020

100%

37 ms

August 2020

100%

43 ms

## Citrix Intelligent Traffic Management

MARCH 21, 2021

Norway

Select a country

GO

Share

CDN Response Time

FASTEST MEDIAN RTT

Fastly CDN

8ms

SLOWEST MEDIAN RTT

Tata Communications  
(Bitgravity) CDN

32ms

LOWEST ERROR RATE

Fastly CDN

0.00%

HIGHEST ERROR RATE

Anonymous CDN

0.41%

Top Platforms

Platform	Median (ms)	Avail.	Ranked median response time. Split into percentile brackets.			
1. Fastly CDN	8	100.00%	<div><div></div></div>			
2. Akamai Object Delivery	9	99.79%	<div><div></div></div>			
3. Lumen CDN	11	99.80%	<div><div></div></div>			
4. Telenor CDN	11	99.79%	<div><div></div></div>			
5. Anonymous CDN	11	99.59%	<div><div></div></div>			

<http://stats.pingdom.com/agujyurfbhrp/512417/history>

<https://www.citrix.com/products/citrix-intelligent-traffic-management/country-reports.html>

# Monitoring

☒ Prod Status ▾

**Live Overview**

Live Status Detail

Error Timeline

Outage Timeline


ServerIP Errors

Error Table

Channel Detail

Search

☒ Non-Prod Status ▾

 Reports ▾

Show Filters

Live Status Overview - Sorted by Failing and Worst Performing Streams

Show 5 ▾ entries Search:

Tools	Product	Format	CDN	Channel	Avg Speed % ▾	Max Speed % ▾	Status % ▴	Status	Average Speed History
≡		HLS	TELENOR		1%	2%	100%	<div><div></div></div>	<div><div></div></div>
≡		HLS	TELENOR		0%	0%	100%	<div><div></div></div>	<div><div></div></div>
≡		HLS	TELENOR		0%	0%	100%	<div><div></div></div>	<div><div></div></div>
≡		HLS	TELENOR		0%	0%	100%	<div><div></div></div>	<div><div></div></div>
≡		HLS	TELENOR		0%	0%	100%	<div><div></div></div>	<div><div></div></div>

CopyPrintExcelPDF

Showing 6 to 10 of 10 entries (filtered from 36 total entries)

Previous12Next

Performance Timeline (Last 4 hours)

Errors Timeline (Last 4 hours)



# Telenor CDN – price model

Distribution basic service for caching / streaming Live and On Demand

Fixed price per month per streaming / cache account

Distribution GB volume per month – price per GB / month

Additional Products: Geo blocking and SSL. Price per service per month

Optional services (ad on)

On Demand – Content Origin

Storage – volume per month – price per GB / month

Just in time formatting – price per GB / month

Live Content Origin

Publishing points – price per channel per month

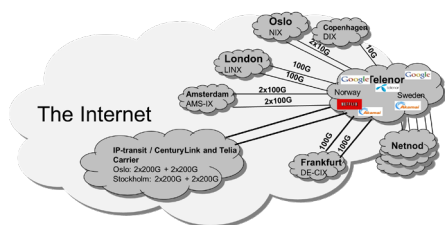
Live Buffer – price per channel per month

Just in time formatting – price per GB / month



# Telenor CDN - highlights

## Scalable distribution to end customers



- Robust CDN platform with nodes in Norway, Sweden
- Telenor's high-quality network in Scandinavia
- Direct access to all Telenor's end users and connected ISP's

## Quality that meet customer needs



- High uptime - measurement last six months of 100 %
- Safety through redundant functions and multiple locations
- Support 24/7/365

## Local and flexible vendor



- Competitive and flexible vendor with local presence and accessibility for our customers
- Telenor's end user
  - 1,7M Fixed broadband
  - 7,5M Mobile broadband

