



Cisco Customer Experience: Expertise to Accelerate Your Network Opportunity

Mobile World Congress

MWC19TM

Barcelona 25-28 FEB



End-to-End 5G Network Lifecycle

Cisco Customer Experience: Expertise to Accelerate Your Network Opportunity

February 2019

Customer Experience for Future Networking

Expertise to accelerate your network opportunity

With a broad portfolio of lifecycle service offerings



Advisory



Implementation



Optimization



Technical



Managed



Training

Relentless focus on **simplicity**, **agility**, and **innovation**

Cisco Customer Experience

Expertise to accelerate your network opportunity

5G Customer Experience Journey



Advisory

- Cross-Domain Transformation ✓
- Network Readiness Assessment
- Use Case Implementation
- Network Migration



Implementation

- Comprehensive Evolved Packet Core Arch
- Model-based Automation & Analytics
- Virtualized and Cloud Native Infrastructure
- CUPS, NSA/SA and MEC Solutions
- Virtualized 5G Multi-Access Radio
- Migration
- Zero Trust, Zero Touch Holistic Security ✓



Optimization

- Mobility Analytics with ML and AI
- Automated Network and Software Fault Mgmt
- Closed Loop Service Assurance
- Software Lifecycle Management
- CI/CD, DevOps and Automated Testing
- Solution Validation ✓



Technical

- Hardware Support
- Software, Product and Solution Support
- Multi-Vendor Mobility Solution Support ✓



Managed

- SP Networking
- Mobility
- Virtualized Infrastructure (NFV/NFVI)
- MSX



Training

- Cisco Packet Core Technology
- Cisco Policy Suite Platform
- Cisco SON
- Model-based Automation & Analytics
- 5G Architecture and Operational Transformation ✓

Cisco Customer Experience End-to-End Value

SP Industry Outcomes

Customer Successes

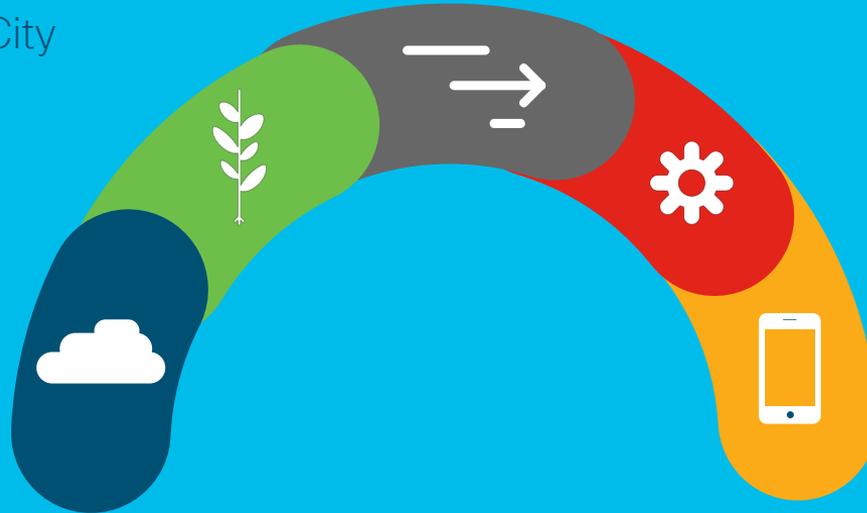
Network Transformation

Beyond the City

AIOps

Cloud Native 5G

All G Ready



...towards 5G



Cloud Native 5G: Delivering a comprehensive and innovative 5G system architecture, starting from scratch

Challenge

As one of the newest mobile network operators in Japan, our customer needed Cisco to

- Lead the design and development of an innovative 4G/5G architecture
- Build multi-vendor, multi-site Telco-Cloud on COTS H/W
- Define and run Cloud Operations
- Secure everything

Action

With a multi-national team of 60 specialists from 12 nations, Cisco Customer Experience delivered inclusive technology implementation:

- Program and Architecture Management office to oversee end-to-end design, solution validation, test automation, and workload deployment and management
- Implemented world's first fully automated virtualized RAN deployment
- Implemented "zero-trust, zero-touch" invisible security with full automation, embedded within overall solution

Results

Through their actions, Cisco Customer Experience were able to deliver:

- Comprehensive solution including Data Center, Packet Core, Transport, Backhaul and more
- **Fully automated** virtualized RAN deployment that reduced radio site deployment from **weeks to minutes**
- Automated, mobile, workload-level security ensuring every network transaction is secured
- **Multi-vendor** CI/CD framework with integrated test automation

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Cisco Customer Experience provided a comprehensive solution, delivering on the customer's mission to launch an innovative 5G system architecture. They were also able to deliver unique innovation to support hyper-scale deployments through an integrated set of **automation, analytics and security capabilities** – as well as the **world's first fully automated, virtualized RAN deployment**, significantly enhancing site deployment efficiency.



Beyond the City: 5G RuralFirst, winner of the UK Government 5G Testbed

Challenge

Pervasive 100% geographical mobile coverage is a significant challenge in the UK and many countries across the globe. 5G RuralFirst aims to:

- Validate 5G technologies in a rural, 'Beyond the City' setting
- Demonstrate solutions that will lower the price point of rural 5G deployment
- Demonstrate revenue use cases that will make rural 5G investment more attractive

Action

The Cisco Customer Experience team:

- Architected & implemented a Cisco 5G core network, in the DataVita Tier III data center in Central Scotland
- Supported 15+ use cases including agri-tech, enhanced consumer mobile broadband, and broadcast over 5G
- Use case examples:
 - Radio broadcast over 5G: BBC R&D
 - eMBB: Parallel Wireless
 - Salmon farming/IoT: Sea health monitoring
 - Tourism: Wi-Fi & AR app: Living Popups
 - Ferry: Wi-Fi backhaul to shore: Phazr
 - Dynamic spectrum sharing: Strathclyde Uni

Results

The team delivered a Cisco 5G core network that supports:

- **15+ use cases** from the 29-partner 5G RuralFirst consortium across the UK
- 4 different 5G test locations
- A 3000 sq km testbed around the Orkney Islands – officially the worst connected part of UK
- Over 1000km across the UK, Orkney Islands to Somerset
- **Orchestration across all partners** by Cisco Customer Experience

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[See Mining >](#)

Cisco Customer Experience, together with Cisco UK & Ireland, has led this project from initial formation, through the competition process to the **design and implementation** of the Cisco 5G core network that now connects the UK from the Orkney Islands, North of the Scottish mainland to Somerset in South West England.



Mining: Combining Mobility & 5G into your private LTE Network to enable autonomous mining

Designing the right architecture to enable real time mining

Challenge

- Difficulty reaching remote non-accessible areas
- Lack of communication in areas with no network coverage and deep in mines
- Needed a low-latency, high-bandwidth video within mines with multiple communication channels
- Telemetry and Automation for reduction of equipment down time

Action

- The Cisco Customer Experience team worked to provide mobile and Wi-Fi local private network
- Cisco's mobile broadband solution is leveraged to provide a high-bandwidth, low-latency solution to the customer
- Solution integration of radio/device types across multiple network operators
- Integrated with IOT, analytics, and mapping for integrated mining operations

Results

The Cisco Customer Experience team was able to:

- Design a Mobility + 5G solution that integrates into the company's private network
- **Enable precision tooling** and location scoping, along with radio and device coverage in remote areas
- Provide **real time video feedback** through autonomous robots over low latency
- **Save costs and improve safety** of lives in mines around the world

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Cisco Customer Experience demonstrated the ability to act as trusted advisor by leveraging our **proven expertise** in Wi-Fi, mobility and enterprise integration to bring about operational and business outcomes.



Network Transformation: Ready for network transformation, with our repeatable, proven methodology and expertise

Challenge

Our customer was faced with outdated and disparate networks, causing:

- Service quality issues in the company's broadband offering
- Challenges in providing competitive service offers, potentially impacting brand reputation
- Need for a holistic network transformation strategy and plan

Action

Cisco Customer Experience worked to design a single network to build strategic partner momentum with:

- Advisory Services (IP Consultancy project)
- Current State Architecture (CSA) and Future State Architecture (FSA) for Operations and Network & Services Infrastructure
- Continuous audits, skills assessment, data center fabric, and automation
- Experienced project management team

Results

Cisco Customer Experience:

- Identified and corrected issues holistically within the operational framework (people/process/tools)
- Assessed network architecture design and resiliency
- Delivered a **transformational network** roadmap for the customer's future vision
- Addressed current challenges with fast turnaround time using **proven Cisco methodology**

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Cisco Customer Experience demonstrated the ability to act as a **trusted advisor**, by leveraging their **proven expertise** to consolidate the customer's network. By enabling the customer to be **5G-ready** and compete effectively with cloud operators, we can now help the customer confidently move to the next phase of this engagement.



AI Ops: Network Audit Automation, saving engineers time from months to minutes

Challenge

A large complex network (150 vEPC nodes, 24 PCRF clusters) needed heavy human effort to manually audit the network.

Typical report takes 1 month to complete with 3 full-time engineers to deliver it.

Due to long turn around time, key issues could not be identified and remediated in a timely manner.

Action

- Cisco Customer Experience built the advanced audit capabilities using Matrix, a flexible analytics platform, to adapt and address customer-specific needs.
- Gathered customer requirements and delivered an agile solution

Results

- This **enabled full automation of the network audits**. Matrix enabled periodic audit which flags key issues proactively to Cisco on-site engineers and customer's operations team for prompt action.
- In addition, Customer Experience developed an operational portal that enables customers to initiate **on-demand audits**.
- This solution brought down **3 months of effort to a few minutes**

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Why Matrix? This Customer Experience analytics capability provides easy adaptability to a wide range of use cases. This enables our engineers to build **customized dashboards** and audit applications specific to the unique operational needs of the customer. By combining the right toolset with people and process, the team was able to **boost the productivity** significantly and **exceed customer expectations**. This enabled the customer and Cisco engineers to focus on higher value-add activities.



All G Ready: Combining Macro & Wi-Fi for connecting the unconnected

Challenge

- Difficulty in providing coverage in remote and developing countries
- Operational complexity of onboarding multiple vendors on a single platform
- Managing multi-country, multiple ISP connectivity
- Telemetry and Automation for reduction of equipment down time

Action

The Cisco Customer Experience team worked on enabling new business models for the customers involved including:

- Cisco's Open vRAN and Wi-Fi solutions are leveraged for providing coverage
- Solution integration of radio/device types, multiple network operators
- Integrated with AI Operations, Managed Services, Solution Validation

Results

The Cisco Customer Experience team was able to:

- Design a Mobility solution that integrates multi national ISP networks with a centralized core
- Enable validation and management of multi vendor disaggregated network
- Proactive fault detection and resolution
- Saving costs and improving lives globally.

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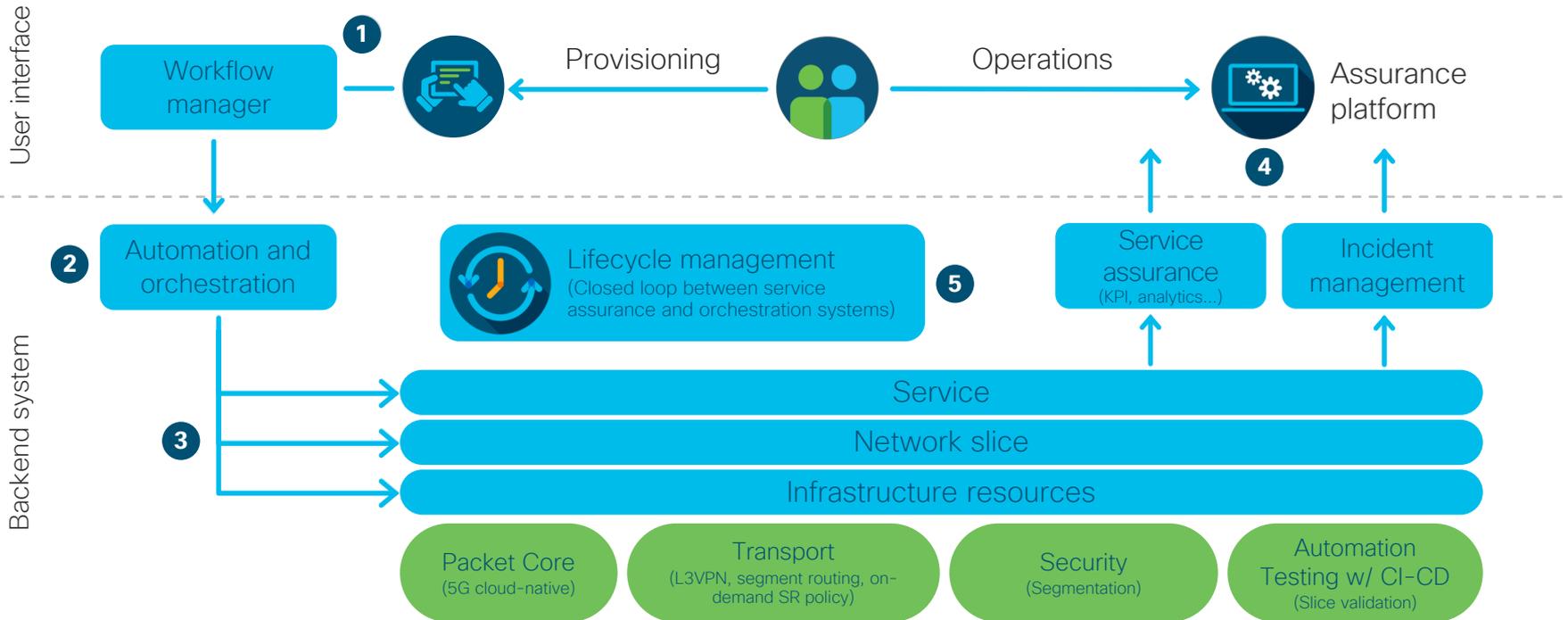
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The value of this engagement is that Cisco Customer Experience demonstrated the ability to act as trusted advisor by leveraging our proven expertise in Wi-Fi, mobility and Solution integration of multi national multi vendor Wi-Fi implementations. e.g. G-Station, Open vRAN consortium.

Network Services Lifecycle

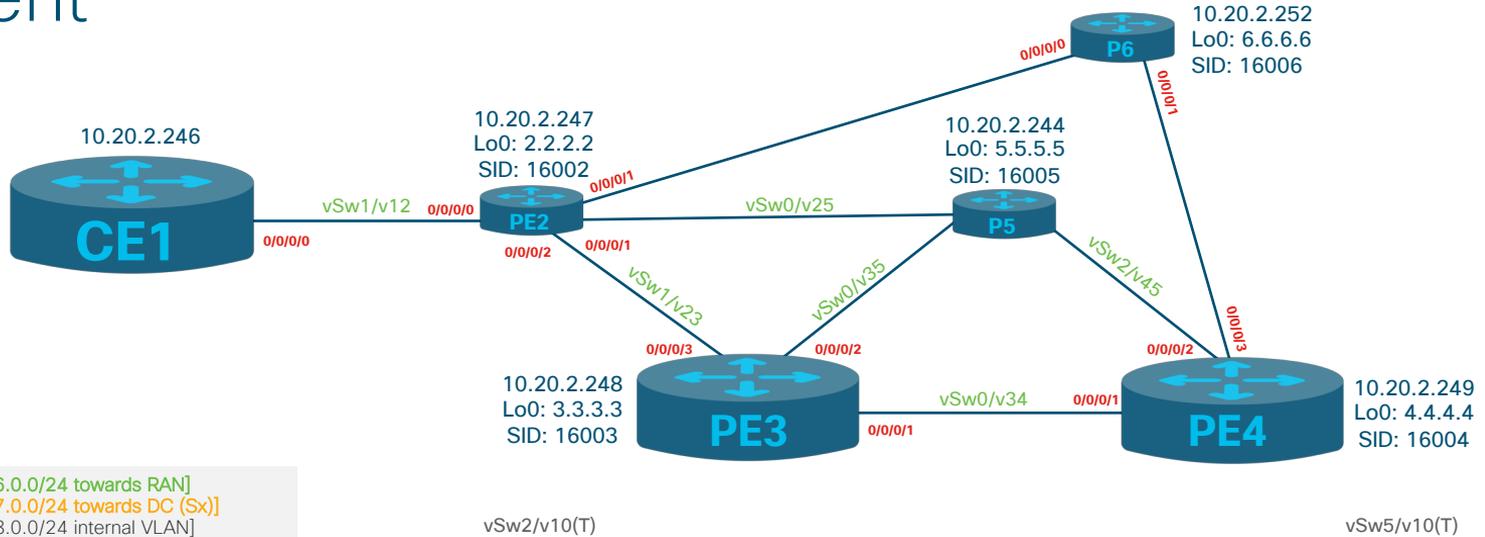
Network services lifecycle workflow

Service request, fulfillment, and assurance portal

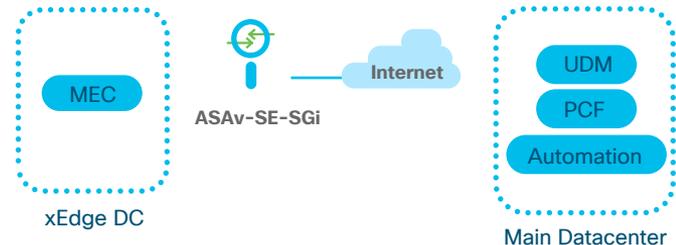


Network Topology – BEFORE network slice deployment

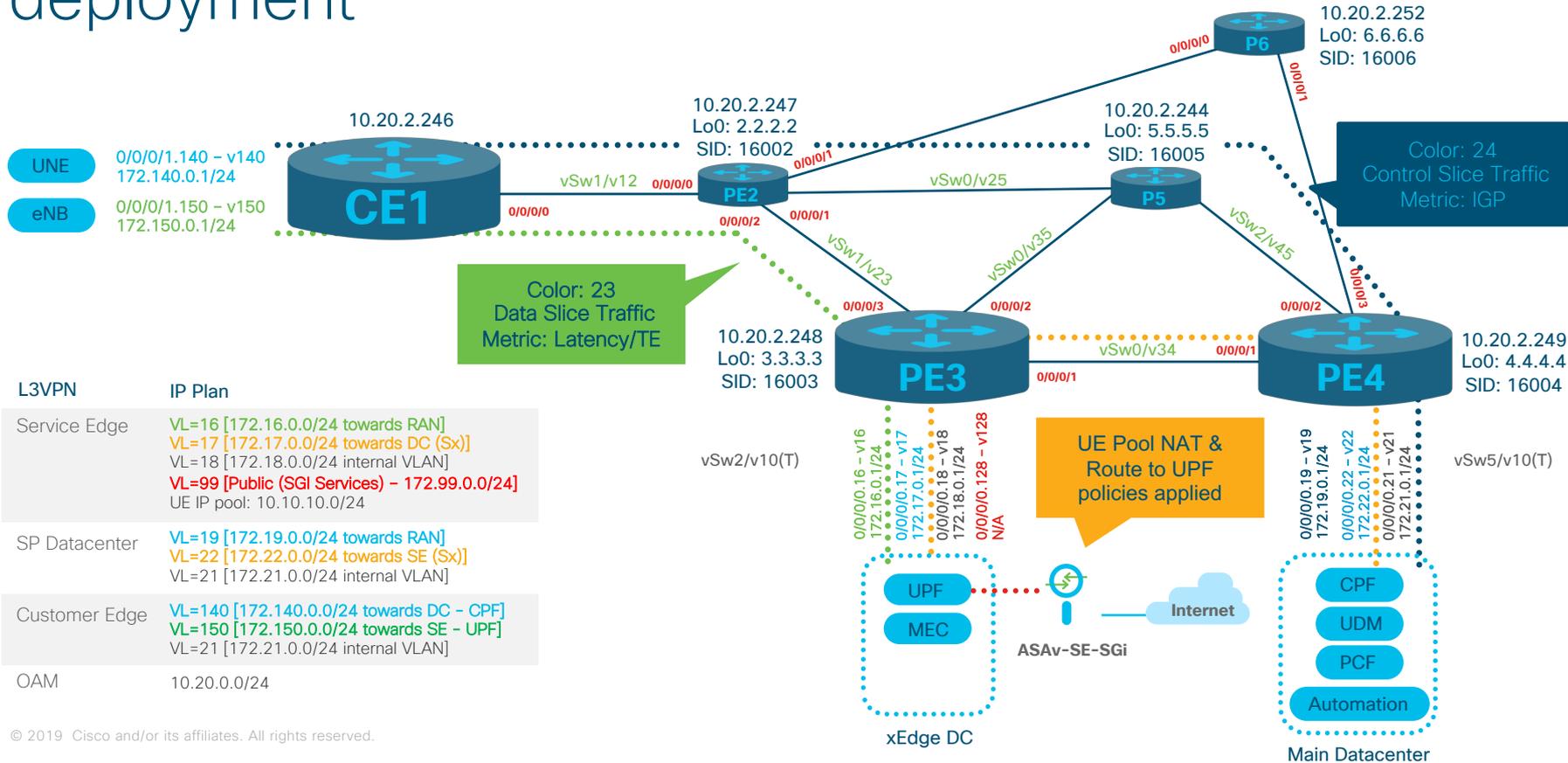
UNE
eNB



L3VPN	IP Plan
Service Edge	VL=16 [172.16.0.0/24 towards RAN] VL=17 [172.17.0.0/24 towards DC (Sx)] VL=18 [172.18.0.0/24 internal VLAN] VL=99 [Public (SGI Services) - 172.99.0.0/24] UE IP pool: 10.10.10.0/24
SP Datacenter	VL=19 [172.19.0.0/24 towards RAN] VL=22 [172.22.0.0/24 towards SE (Sx)] VL=21 [172.21.0.0/24 internal VLAN]
Customer Edge	VL=140 [172.140.0.0/24 towards DC - CPF] VL=150 [172.150.0.0/24 towards SE - UPF] VL=21 [172.21.0.0/24 internal VLAN]
OAM	10.20.0.0/24



Network Topology – AFTER network slice deployment



The Cisco Customer Experience Evolution

Aligning to your lifecycle



Work together

- Customer success
- Services
- Architectures
- Partners



Transform

- Remove complexity
- Simplify the portfolio
- Focus on the journey
- Value in each step



Do more, faster

- Easier to do business
- Smoother transition
- Speed your success
- Earn trust every day

