The following are samples of tools and practices I implemented at my previous job as a Director of Software Engineering and Development Operations, including systems and environment specifications.
Unfortunately, due to NDAs, I cannot share up-to-date corporate information, but I hope that provided data will be enough to show the scale of the systems I managed, technology, tools and processes used for these systems' delivery and maintenance. Some information was copied from my presentations I provided to the leadership (status, performance, capacity reports) and conferences where I presented the company's technology innovations or technology stacks to cross-divisional teams and partners.

- Production quality monitoring shown below is used in the development and test environments
- Scalability and Performance Testing is done using special test environments
    - for mission-critical systems or services, data and configuration are cloned from production environment with further obfuscation of customers private data, including a clone of the network security configuration for data storage, firewalls, load-balancers and routers

Achievements in B2C and B2B system integrations:

- Post-acquisition integration of three tax software companies:
    - streamlining technology operations, consolidating API frameworks, and restructuring teams
- Developed strategic partnerships with major financial service providers, supporting B2B and B2C integration solutions:
    - Federal agencies: IRS and States electronic filing systems
    - Bank and trust services: HSBC, Santa Barbara, River City, Republic Bank, PwC

Capacity and specification overview of some core backend systems:

- Codebase & Technology
    - Production system support:
        - 24x7x365 ("follow-the-sun" operations shifts)
        - Data centers:
            - Managed-Services: Two geographically redundant IBM data centers
            - Cloud platforms:
                - Primary Azure; Secondary: AWS
        - Support of ~ 5,000 deployable apps or services (per environment)
        - Storage and data sizes:
            - Storage units provide access for users and system to over 400 TBs of data
            - Oracle and Microsoft SQL databases
                - ~ 47 servers, some databases size is over 80 TB
        - Total number of servers: ~ 900 virtual and physical servers
        - Tools:
            - Monitoring: primarily DataDog, AppDynamics, and SCOM
            - Incident Management and Escalation processes: PagerDuty, ServiceNow
        - Supported Compliance: SOX, SSAE, ISO, GDPR, NIST, PCI
        - Support for Business Continuity is based on high availability, data protection, and disaster recovery:
            - Redundant data centers, near real-time data backup and log shipping (Oracle, MS SQL)
            - Cloud availability zones (Azure)
            - Web and API traffic management
    - Customers:
        - over 60,000 small and medium-sized businesses (~ 700,000 million commercial users)
        - over 10,000 government users (IRS and military personal)
    - Back-end processes and services:
        - .Net (C#), RESTful HTTP services, WCF, Redis, Microservices
        - Oracle 12c, MS SQL, SSIS, SSRS, MySQL
    - Cloud-native, business web apps and e-commerce (customer-facing and internal):
        - ASP.NET (C#, HTML, CSS), MVC, JSON, JQuery
        - Ajax (moving to React Native), JavaScript (moving to TypeScript)
        - Web API, Java
    - Windows desktop applications (commercial customers)
        - Delphi, .Net/C#
    - Mobile apps:
        - Google Flutter
        - Apple Swift development platforms
        - Automation: Maven, Jenkins
    - Source Control/Backlog Management/Defect Tracking:
        - Primary: Visual Studio Online (using Git repos)
            - Methodologies:
                - Test, Event and Domain-Driven Design
                - Scaled Agile Framework (Software Engineering and QA
                - Kanban (used by Automation and IT)

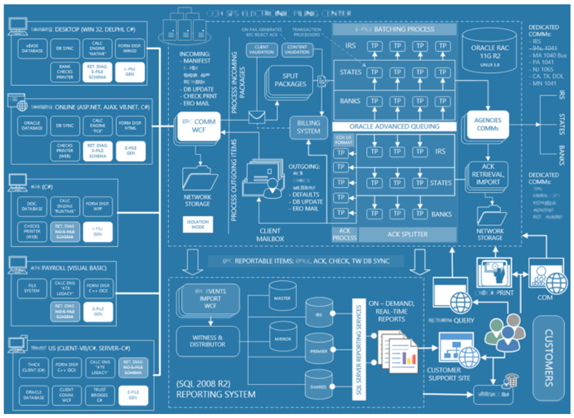
    - Core backend system: ~ 7,000 files, 121 GB size
    - Cloud-native app: ~ 5,000 files, 460 MB size
  - Corporate Git repositories at GitHub
  - Automation, Configuration Management, Continuous Integrations:
    - Primary:
      - Azure DevOps (integration with on-premises configuration and build processes)
      - TFS based build and configuration systems
    - Automation:
      - Azure DevOps (Continuous Integrations and Delivery workflows)
      - Maven, Jenkins
      - Scripting: PowerShell, Bash, Python
      - Infrastructure as a Code:
        - VMWare Automation platform
        - Windows Desired State of Configuration
        - Azure Resources, Terraform
      - Log & Event Management
      - Security monitoring: Azure Security Center and IBM QRadar
- Data Analytics (cross-divisional business analytics platform):
  - TBs of data aggregated and processed daily
    - sources:
      - Transactional business systems, logs, and monitoring
      - Software development tools (backlog, capacity, defects, etc.)
      - Backoffice integrations: internal CRMs, financial processing system, Salesforce
  - Analytics are visualized using Microsoft PowerBI platform (mix of on-premise based and Azure services)
  - Analytics are used in day-to-day operations and product development decision-making supported by facts
  - Analytics users:
    - Engineering/QA/Automation:
      - Daily systems usage and performance analysis
      - Capacity planning
    - Product and Project management
      - Product features planning and prioritization
      - Projects status and daily standups
    - the Leadership
      - Budgeting, Future strategic and roadmaps planning

System Diagrams, Monitoring and Data Analytics

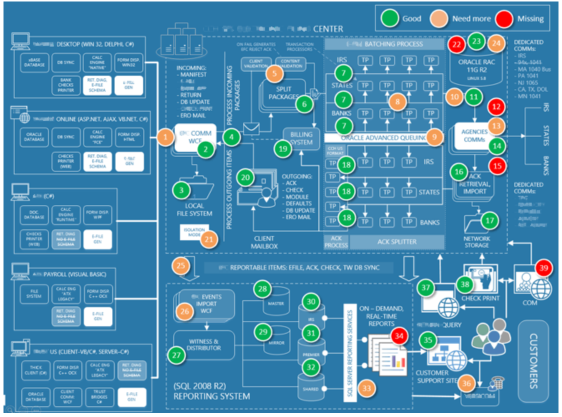
- *all slides are created by me either for internal use in architectural reviews or for internal/leadership presentations*
- *each deployable component shown on the blue-print was automated:*
    - *environment provisioning (virtual compute resources, storage, most of networking and firewall/load-balanced rules)*
    - *built continuously integration which triggers builds and deployments to development, test and production environments*
    - *for components with automated testing enabled in production, tests are launched as a part of continuous delivery*

High volume transactional system's architecture blueprint:

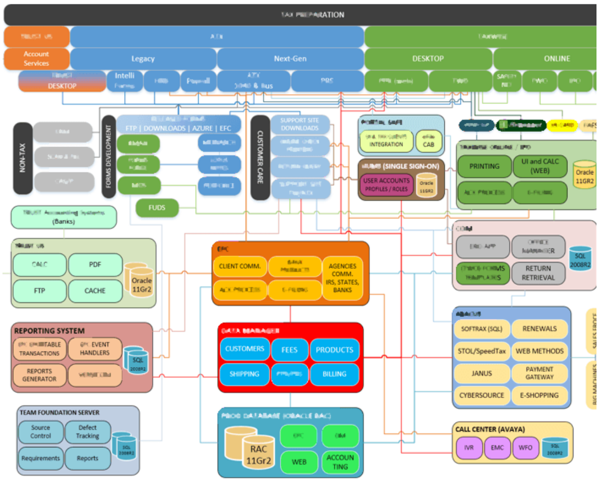
Old architecture, prior microservices refactoring, and migration to the cloud



A result of a barnstorm meeting focused on monitoring review of a backend system *(red dots represent missing monitoring of a system's critical end-point)*

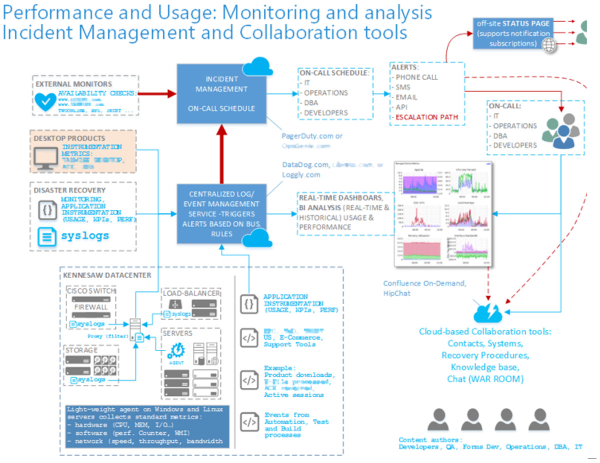


An overview of the products ecosystem:



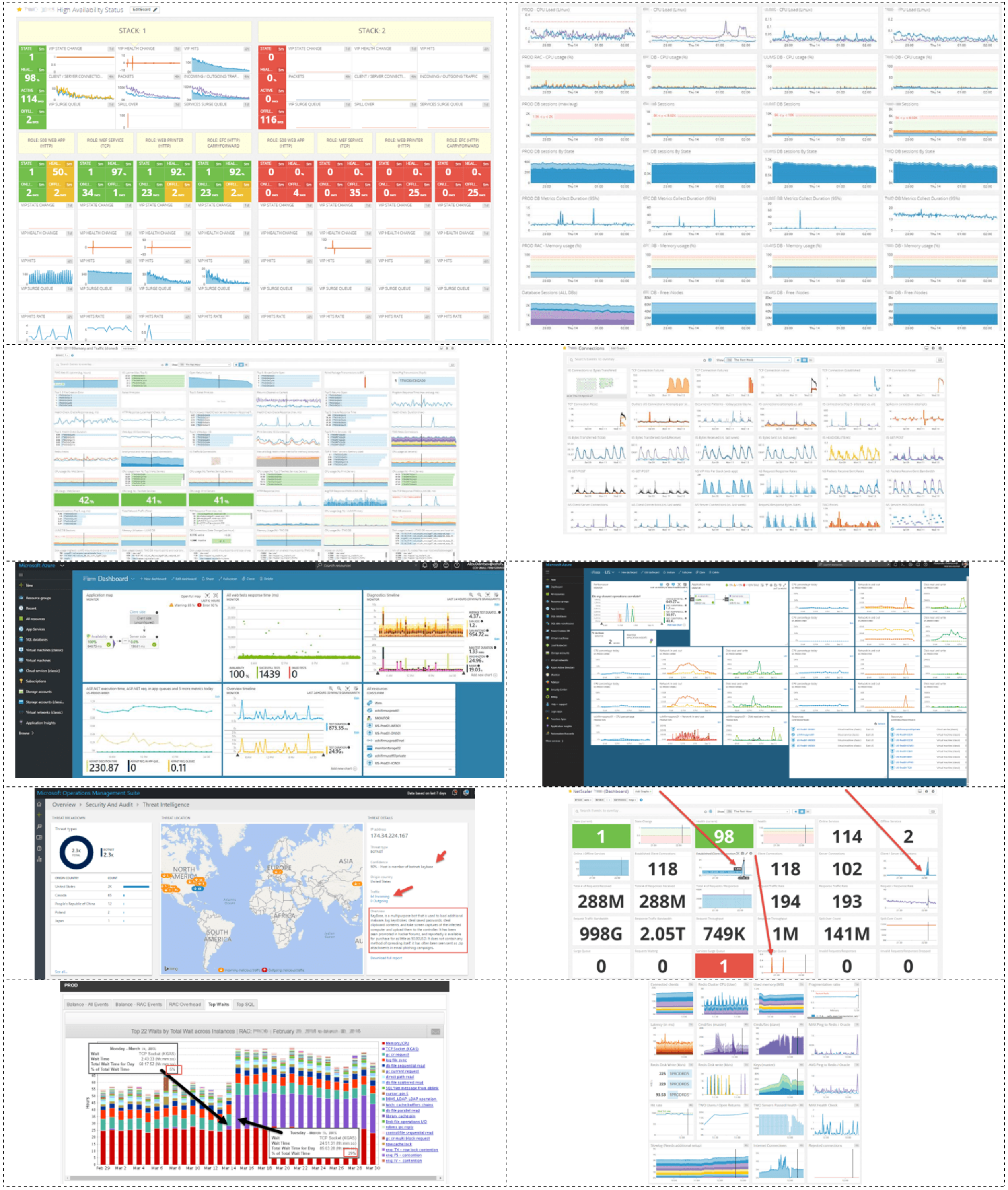
Overview of the Monitoring and Incident Management

(shown a vision of this global initiative which was significantly improved and implemented)


Performance and Usage: Monitoring and analysis
Incident Management and Collaboration tools
off-site STATUS PAGE (supports notification subscriptions)
EXTERNAL MONITORS
AVAILABILITY CHECKS:
INCIDENT MANAGEMENT
ON-CALL SCHEDULE
ON-CALL SCHEDULE:
- IT
- OPERATIONS
- DBA
- DEVELOPERS
ALERTS:
- PHONE CALL
- SMS
- EMAIL
- API
- ESCALATION PATH
ON-CALL:
- IT
- OPERATIONS
- DBA
- DEVELOPERS
DESKTOP PRODUCTS
INSTRUMENTATION METRICS:
PagerDuty.com or
DataDog.com,
Loggly.com
DISASTER RECOVERY
MONITORING, APPLICATION INSTRUMENTATION (USAGE, KPIs, PERF)
syslogs
CENTRALIZED LOG/ EVENT MANAGEMENT SERVICE -TRIGGERS ALERTS BASED ON BUS. RULES
REAL-TIME DASHBOARS, BI ANALYSIS (REAL-TIME & HISTORICAL) USAGE & PERFORMANCE
KENNESAW DATACENTER
CISCO SWITCH
FIREWALL
syslogs
LOAD-BALANCER
syslogs
Proxy (filter)
STORAGE
syslogs
SERVERS
AGENT
Light-weight agent on Windows and Linux servers collects standard metrics:
- hardware (CPU, MEM, I/O…)
- software (perf. Counter, WMI)
- network (speed, throughput, bandwidth
APPLICATION INSTRUMENTATION (USAGE, KPIs, PERF)
US, E-Commerce, Support Tools
Example: Product downloads, Active sessions
Events from Automation, Test and Build processes
Confluence On-Demand, HipChat
Cloud-based Collaboration tools: Contacts, Systems, Recovery Procedures, Knowledge base, Chat (WAR ROOM)
Content authors: Developers, QA, Forms Dev, Operations, DBA, IT

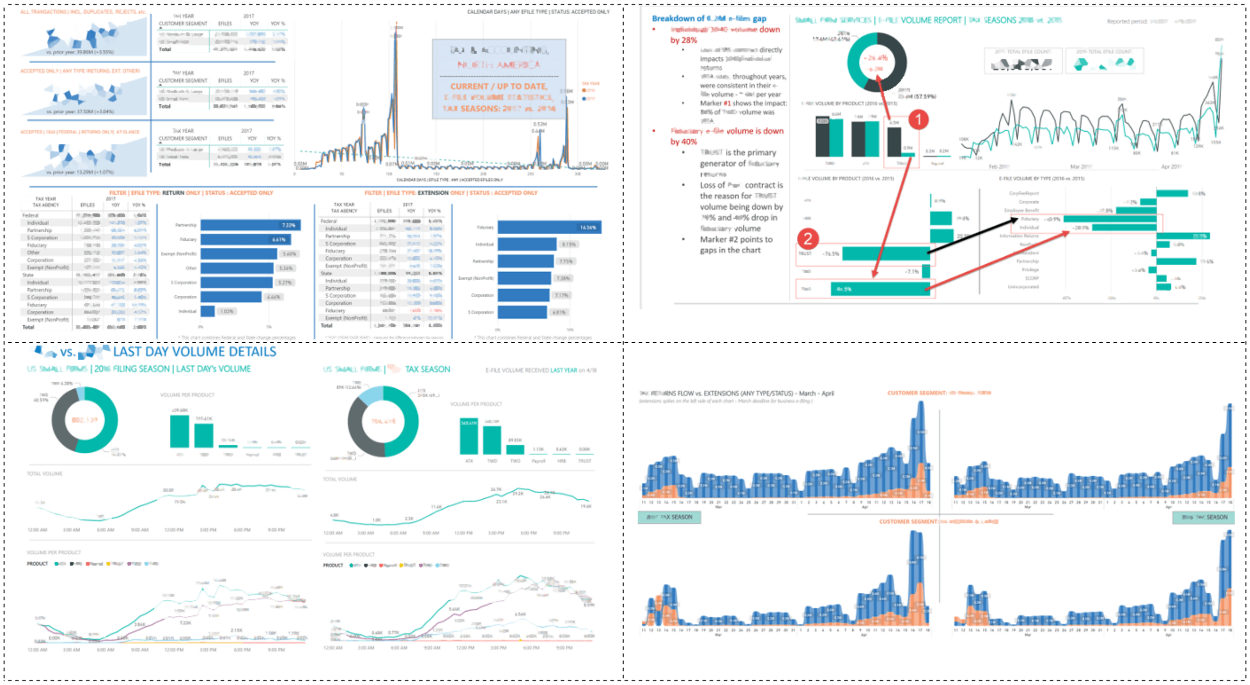
Monitoring dashboards (shown screenshots from DataDog and Microsoft Azure DevOps systems)

- *Collected data is aggregated as part of the cross-divisional Data Analytics initiative which allows similar systems KPIs (performance and product metrics) compare across business units*
- *Dashboards were also used by the scalability team during stress and load testing*
- *Obvious use by data center operations, software and IT engineers*
- *Dashboards provide a "single pane of glass" view across monitored systems combining business applications and services KPIs with environment's performance, usage and capacity metrics (network, storage, etc.)*



Data Analytics

- *Examples below show analytics for statics research and annual projections*



Breakdown of [redacted] gap

- [redacted] volume down by 28%
  - [redacted] directly impacts [redacted]
  - [redacted] throughout years, were consistent in their [redacted] volume - [redacted] per year
  - Marker #1 shows the impact: [redacted] of [redacted] volume was [redacted]
- [redacted] volume is down by 40%
  - [redacted] is the primary generator of [redacted]
  - Loss of [redacted] contract is the reason for [redacted] volume being down by [redacted] and [redacted] drop in [redacted] volume
  - Marker #2 points to gaps in the chart