

DevOps for Salesforce

- or -

"Why the business has been bypassing IT for decades
but is now in over their heads,
and how you can help without going insane"



Andrew Davis
Sr. Director of Research & Innovation
Copado
Author of
Mastering Salesforce DevOps

adavis@copado.com
[@AndrewDavis_io](https://www.twitter.com/AndrewDavis_io)



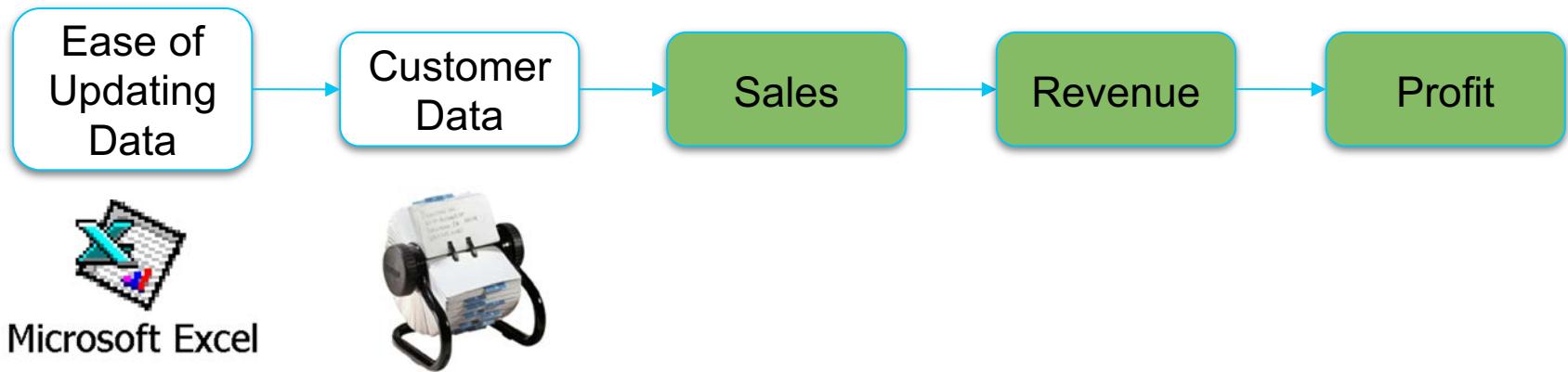
What the heck is Salesforce, and why should you care?

Salesforce ...

- The business
- The technology
- The acquisitions
- The community
- The parties
- The mascots
- The real estate

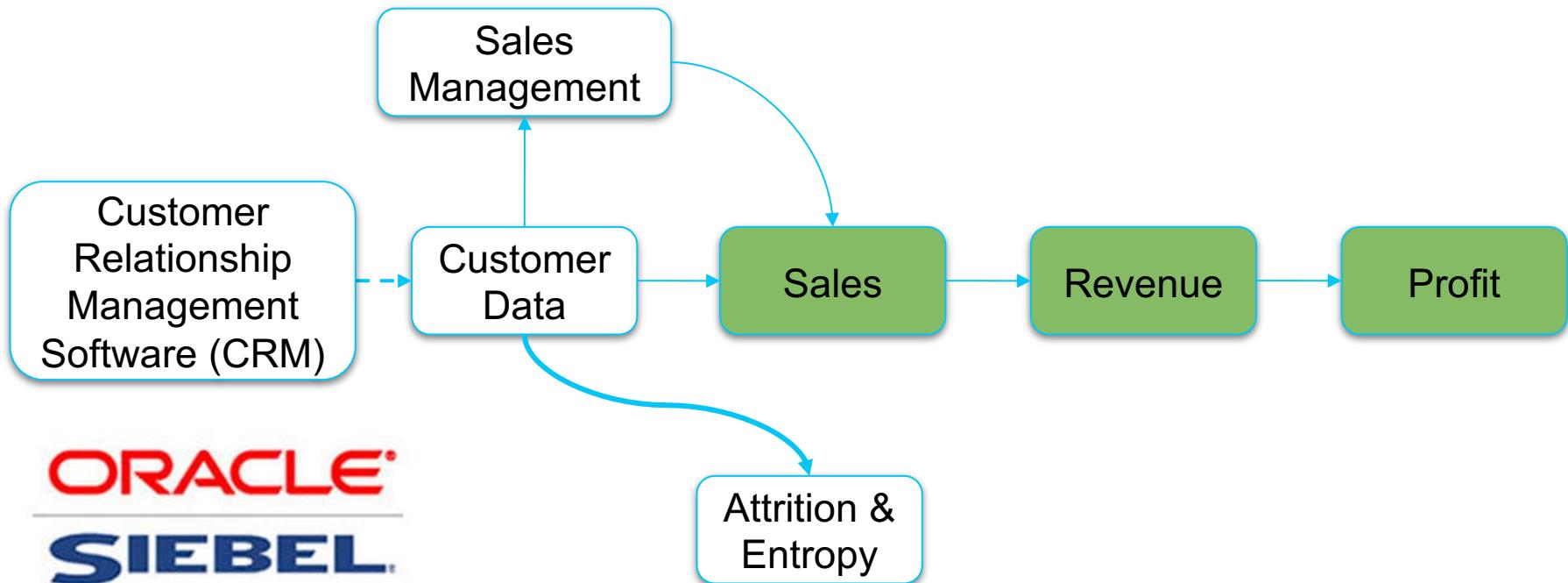
Why Start with Sales?

You've got opportunities. What's limiting your profitability?



The Rise of CRM (circa 1998)

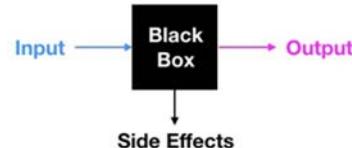
Tracking and retaining customer data



ORACLE
SIEBEL

How to Install Your Own CRM (circa 1998)

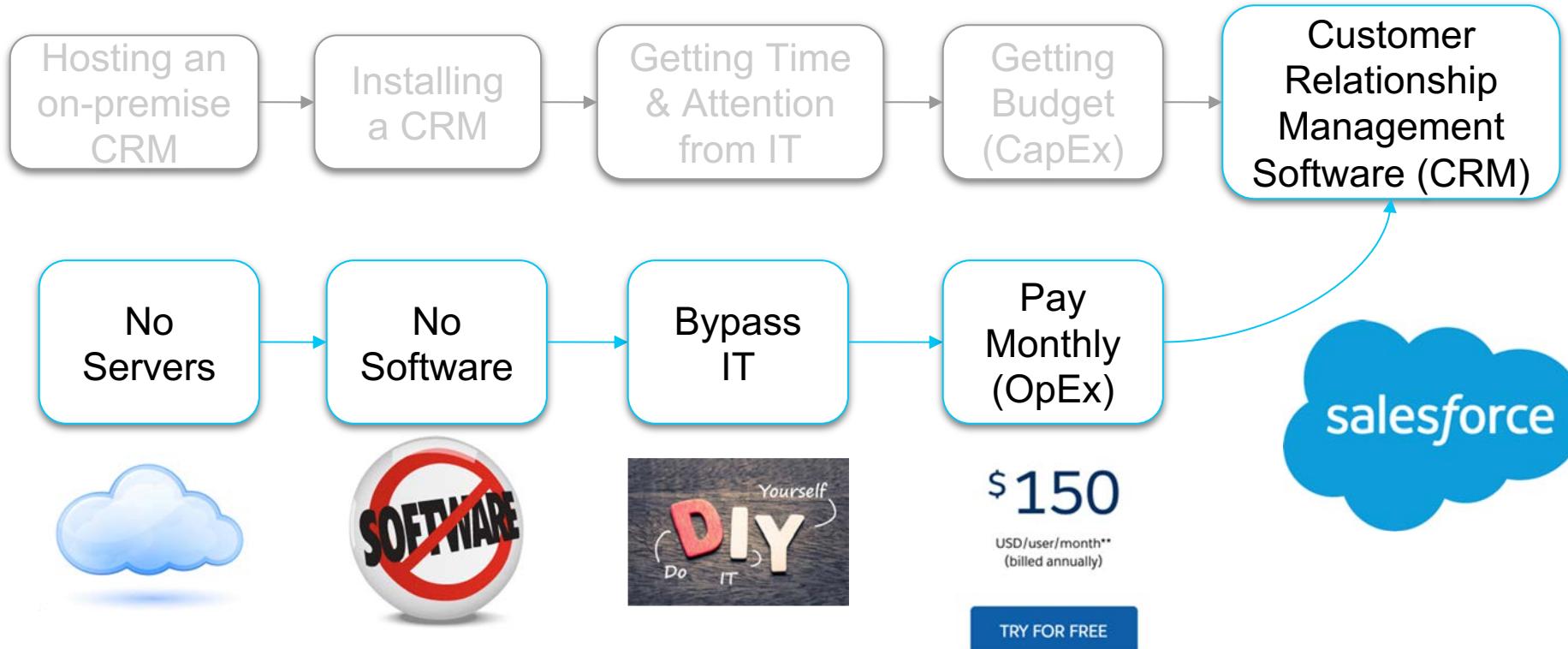
In under 3 years and \$5,000,000

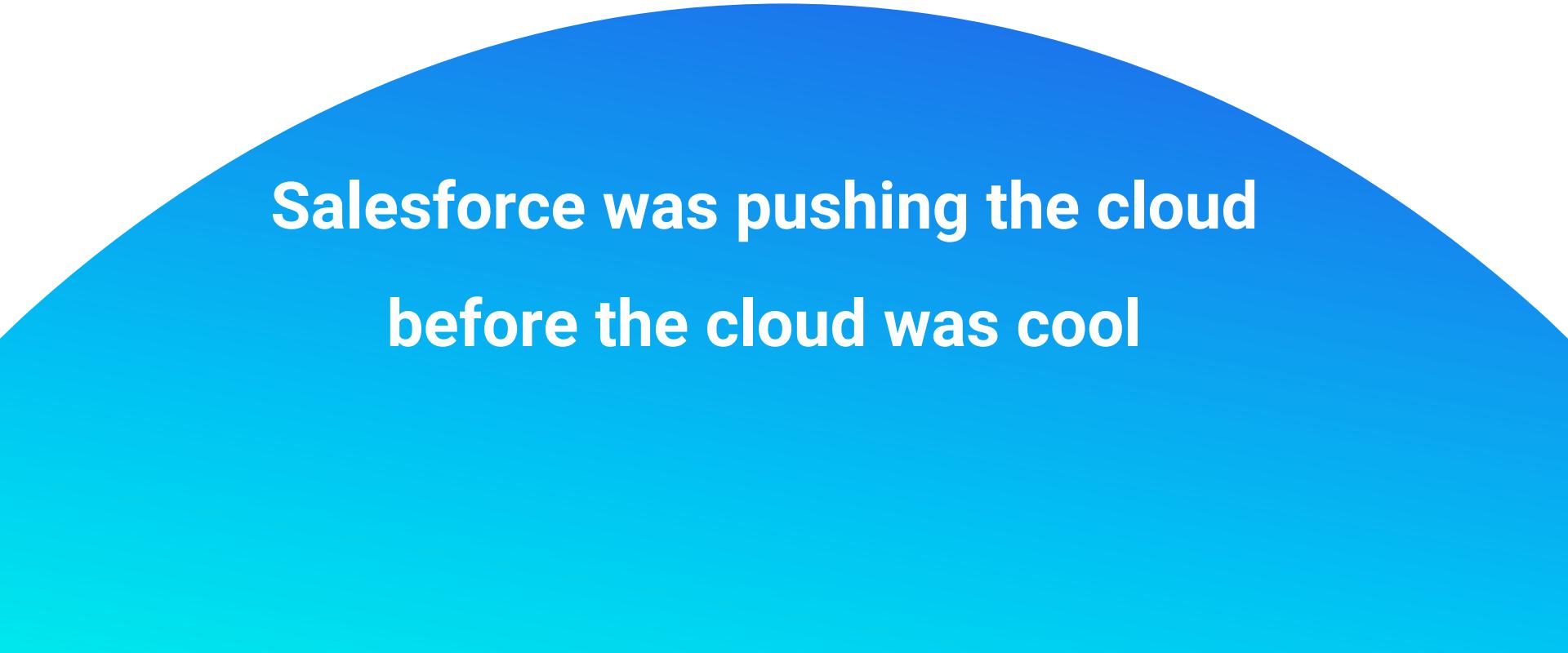


ORACLE
SIEBEL

The Cloud CRM Alternative (since 1999)

Get started quickly, simply, and affordably





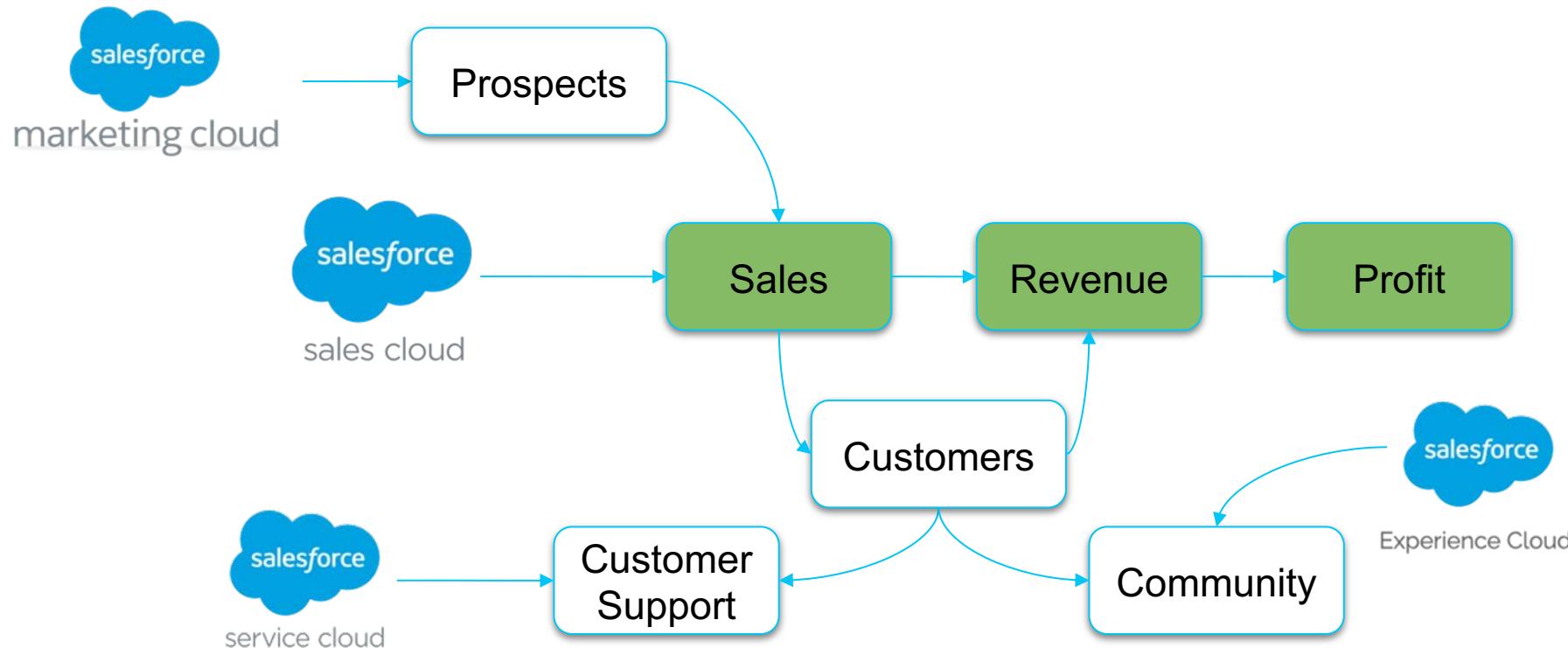
**Salesforce was pushing the cloud
before the cloud was cool**

Benefits of Salesforce in a Nutshell

- They host all the infrastructure
- Major upgrades 3x/year
- They provide support, security, training, etc
- Application addresses most common needs
- Highly customizable

Why Stop with Sales?

Salesforce continues to address adjacent needs



Salesforce Leads in Service, Marketing, and More

Leader in
multiple
Analyst
categories



MOST INNOVATIVE
COMPANIES IN
THE WORLD
Forbes
2018



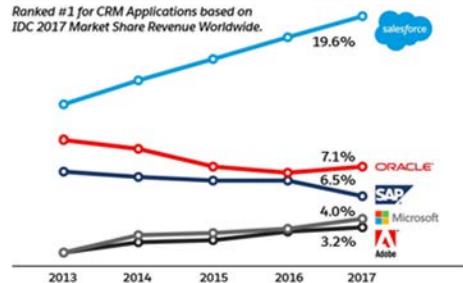
WORLD'S MOST
ADMIRERED COMPANIES
FORTUNE
2013-2019



#1 CRM 7 YEARS
IN A ROW*
IDC
Analyze the Future
2013-2020H1

Salesforce. #1 CRM.

Ranked #1 for CRM Applications based on
IDC 2017 Market Share Revenue Worldwide.



Source: IDC, Worldwide Semiannual Software Tracker, April 2018.

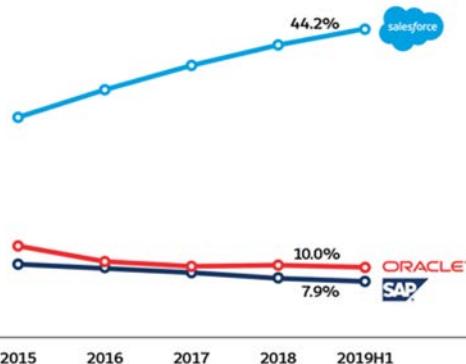


salesforce.com/number1CRM

Salesforce.com market includes the following IDC-defined functional markets: Sales, Customer Service, Contact Center, and Marketing Applications. © 2018 salesforce.com, Inc. All rights reserved. Salesforce.com is a registered trademark of salesforce.com, Inc., or its other names and marks.

Ranked #1 in Service.

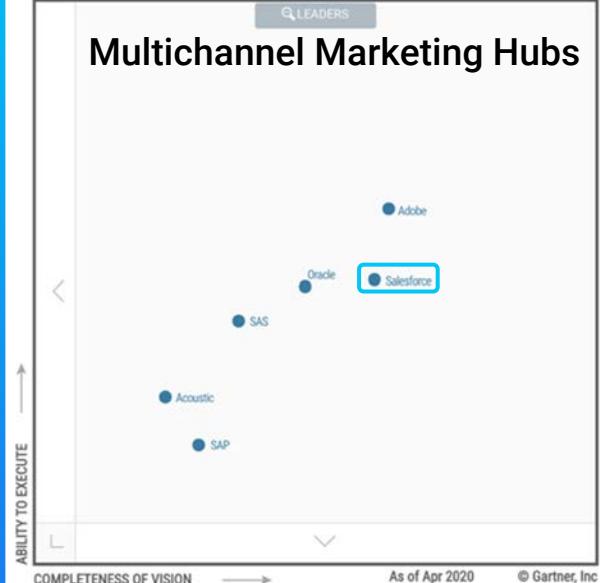
Ranked #1 for Customer Service
Applications based on IDC 2019H1
Revenue Market Share Worldwide.



Source: IDC, Worldwide Semiannual Software Tracker, Oct. 2019.

2020 Magic Quadrant

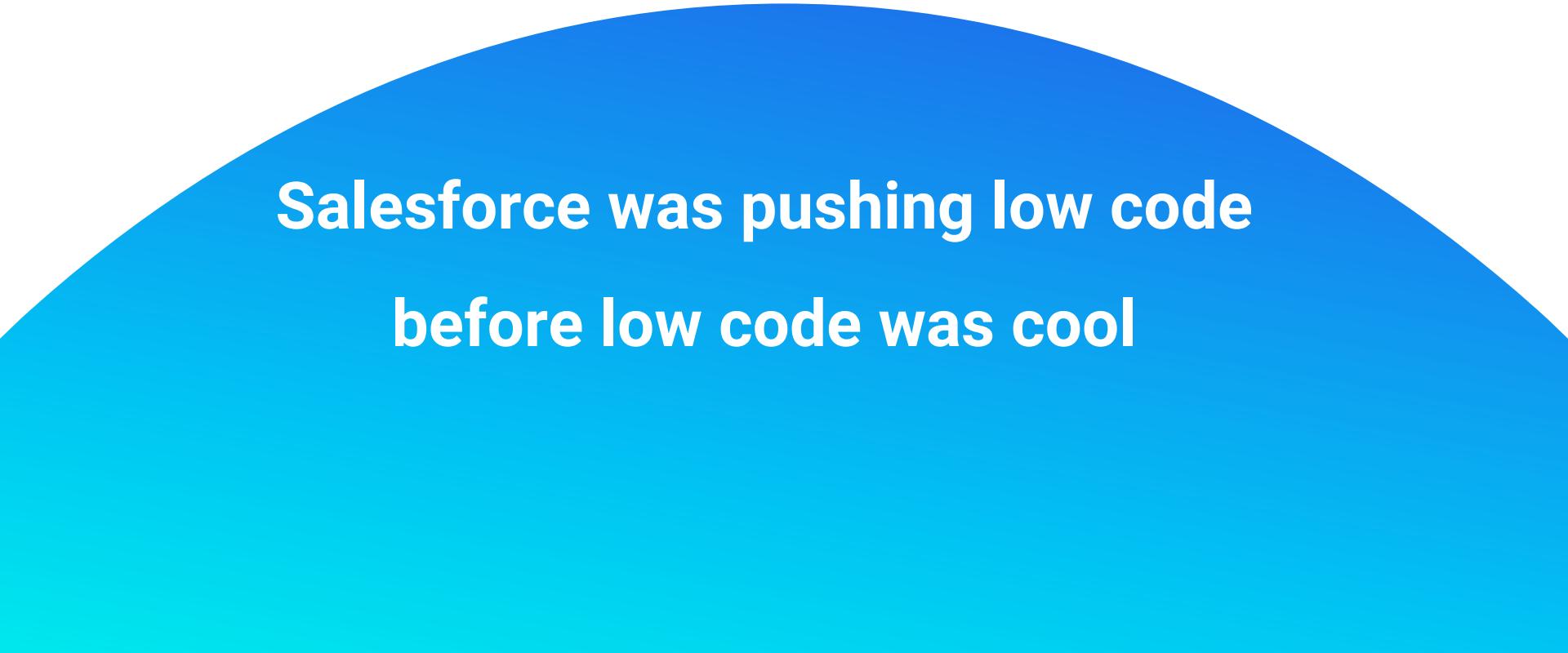
Multichannel Marketing Hubs



As of Apr 2020

© Gartner, Inc.

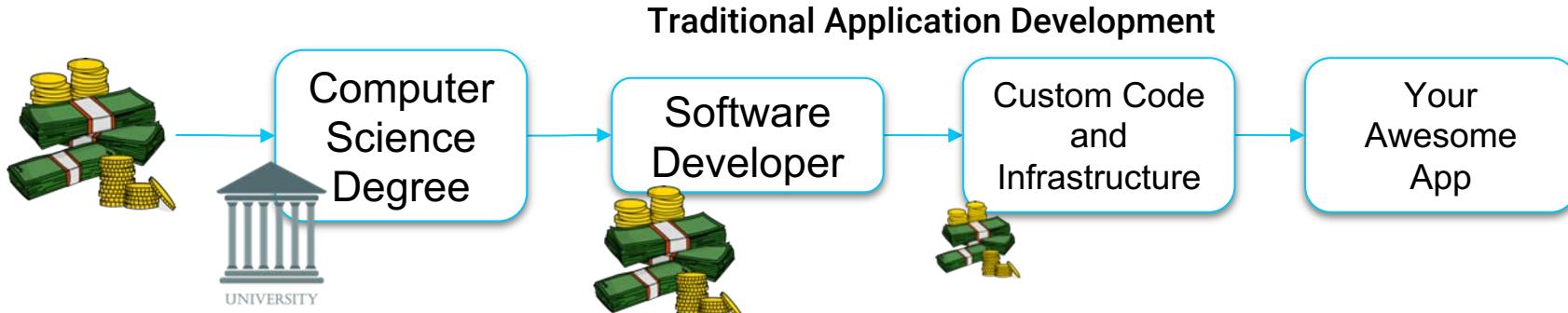
DO



**Salesforce was pushing low code
before low code was cool**

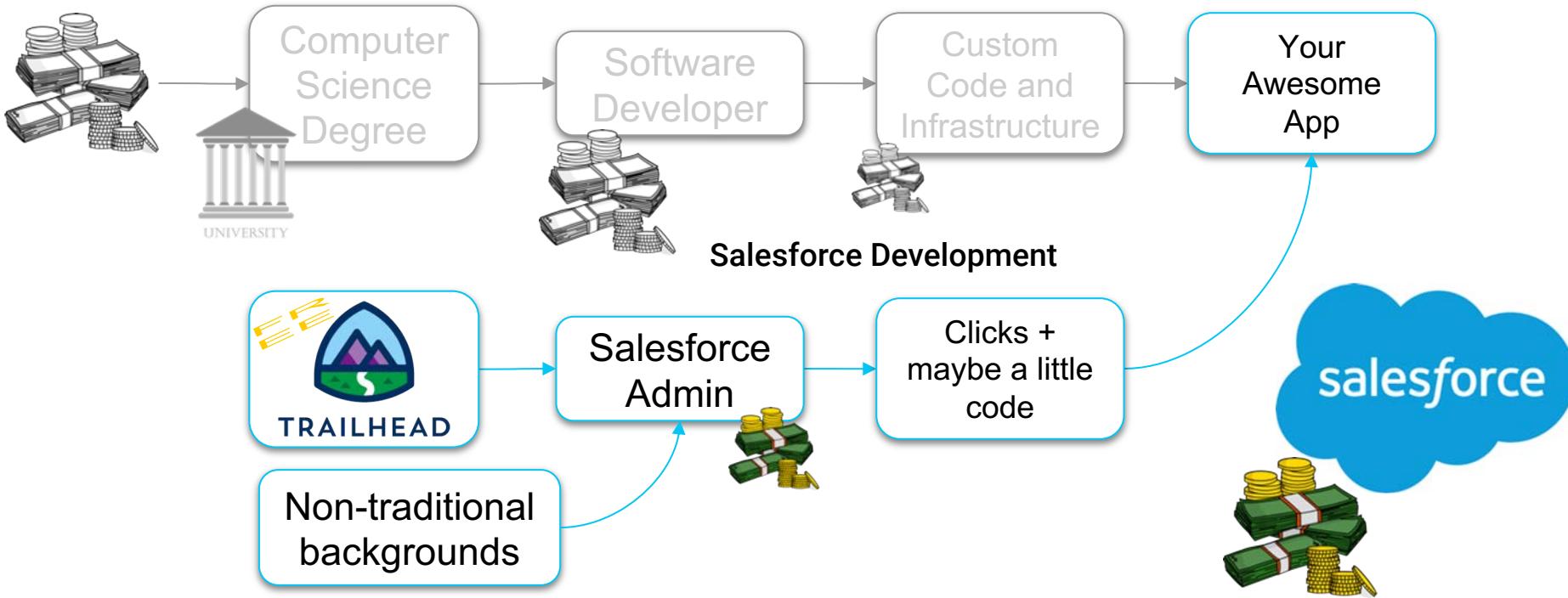
Application Development: The Traditional Way

You know it, you love it



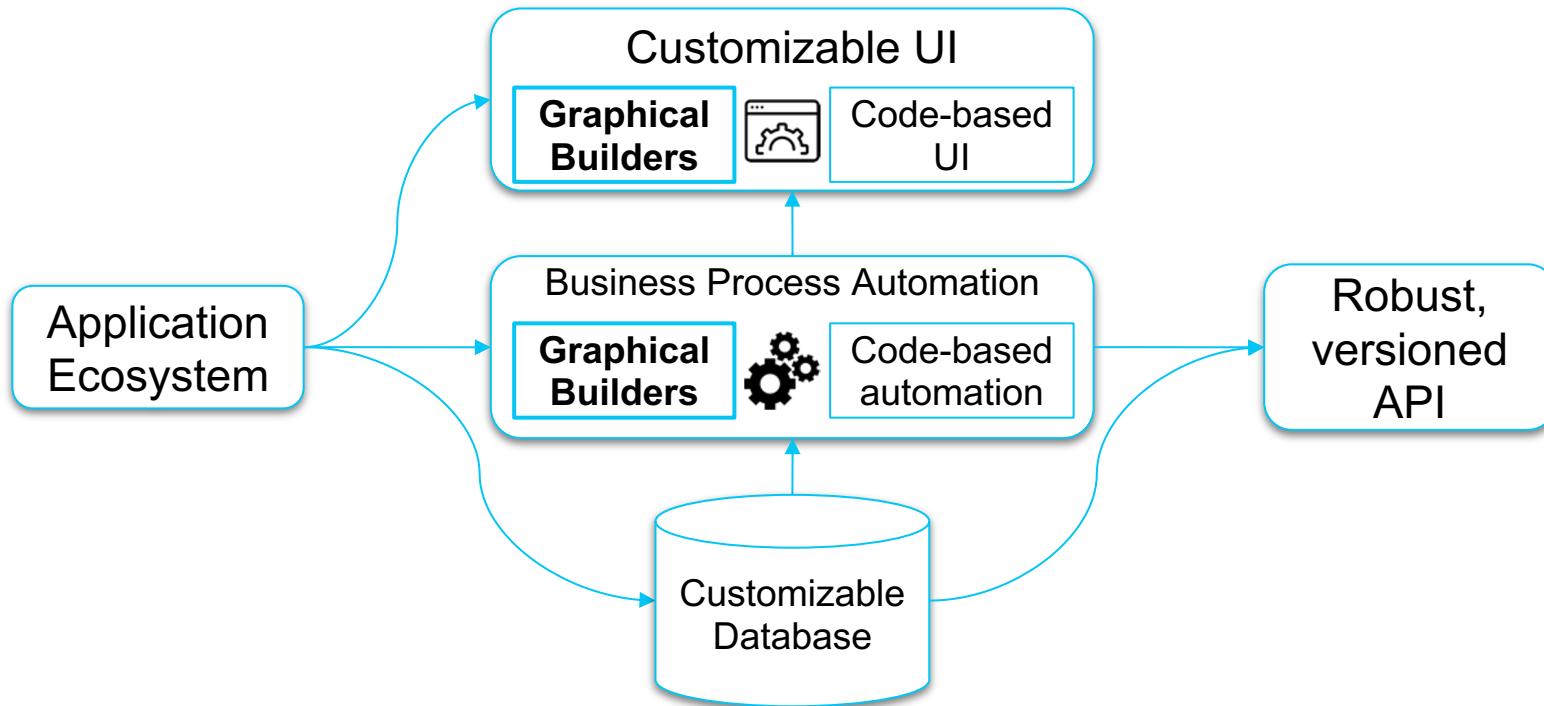
Application Development: The Salesforce Way

Oooooo ... that was kind of easy



Custom Application Development

aka: the fun bit



Salesforce World and Culture



KICKSTART YOUR CAREER

There are over a million jobs in the Salesforce ecosystem. Whatever your background or interests, there's a path for you.



Salesforce
Administrator



Salesforce
Developer



Sales
Manager



Marketing
Manager



Salesforce
Technical
Architect



Business
Analyst



Other Roles



The Salesforce Community is ... shall we say ... Dedicated



The rise of Low Code

“By 2025, 70% of new applications developed by enterprises will use low-code or no-code technologies (up from less than 25% in 2020).”

“50% of all new low-code clients will come from business buyers that are outside the IT organization.”

- Gartner Forecast Analysis:
Low-Code Development Technologies

Magic Quadrant for Enterprise Low-Code Application Platforms



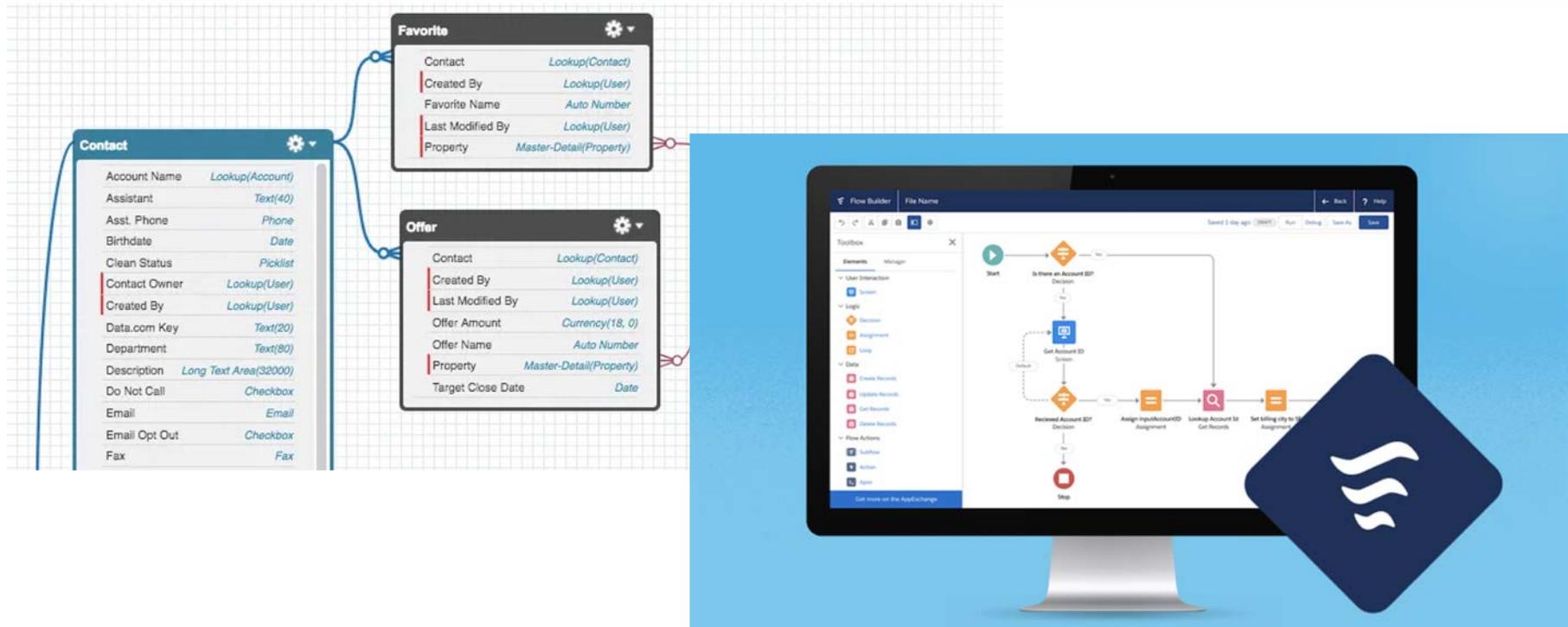
Source: Gartner (September 2020)



The weird world of DevOps for Salesforce

- “Salesforce” vs. Salesforce
- Check your tools at the door
- Salesforce Metadata
- XML Hell
- Salesforce DX
- Commercial Tools

Salesforce makes it easy to build





Easy is Great*

*Some conditions apply



The trouble with Easy:

Easy \Rightarrow **Fast** \Rightarrow **More** \Rightarrow **Complex**



Things add up



Bigger orgs with bigger teams
need to be increasingly careful



The Development Lifecycle

Where Things Get Complicated



Learning to Drive
with Trailhead



Traffic Engineering
The largest Salesforce orgs



Challenges

- Keeping Orgs in Sync
- Tracking Changes
- Propagating Changes Systematically
- Risk of Interactions and Side-effects
- Accumulation



Notable Acquisitions

Salesforce has acquired more than 60 companies



HEROKU

Platform as a Service



MuleSoft

Data Integration



+ a b | e a u[®]

Analytics



Collaboration



MetaMind

AI / Deep Learning

The Salesforce Marketecture

Includes both core capabilities and acquired companies



But Only a Subset of this is the “Salesforce Platform”

Many Salesforce tools are totally disconnected



On-premise vs. IaaS vs. PaaS vs. SaaS



Most DevOps Tools focus on supporting IaaS or PaaS systems

Infrastructure as a Service

Create virtual servers, networks, storage, etc.

Platform as a Service

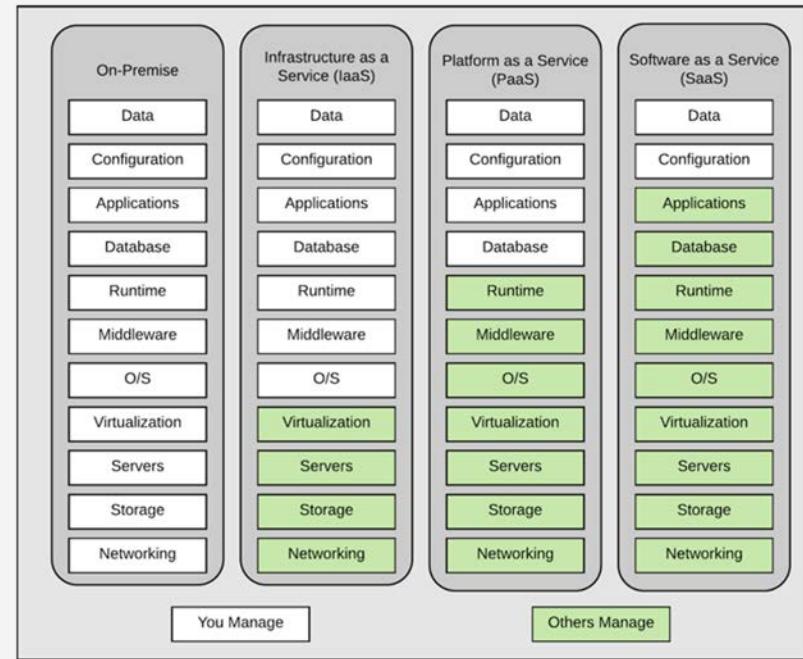
Upload code, databases, etc.

Software as a Service

Configure applications, store data

Salesforce

Functions like a PaaS, configured like SaaS



Typical Tools Used in DevOps Processes

Most DevOps Tools focus on supporting IaaS or PaaS systems



PERIODIC TABLE OF DEVOPS TOOLS (V1)																	
1	En	O	12c														
3	Fr	Gt	13b														
5	My	MySQL	14														
11	En	Mq	MSSQL	Sv	Subversion	15											
19	Fr	Pq	PostgreSQL	Mc	Mercurial	21	Os	22	Os	23	En	24	Os	25	Pd	26	Os
37	Os	Mg	MongoDB	Gh	Github	39	Os	40	Os	41	Fm	42	Fm	43	Fm	44	Fm
55	En	Db	DB2	Bb	Bitbucket	57	Fm	58	En	59	Pd	60	Fm	61	Fm	62	Os
73	Fr	Cs	Cassandra	Hx	Helix	75	Os	76	Os	77	Os	78	Os	79	Fm	80	Os
91	En	Xlr	XL Release	Ur	UrbanCode Release	92	En	93	En	94	En	95	En	96	Pd	97	En
106	En	Sp	Splunk	Ki	Kibana	107	Os	108	Fm	109	Os	110	Os	111	Os	112	Os
113	Os	Nr	New Relic	Ni	Nagios	114	Os	115	Os	116	Os	117	Os	118	Os	119	Os
119	En	Gg	Ganglia	Ct	Cacti	120	En	121	Os	122	Os	123	Os	124	Os	125	En
126	En	Gr	Graphite	Gr	Icinga	127	Os	128	Os	129	Os	130	Os	131	Os	132	Os
133	Os	Ic	Icinga	Sl	Sumo Logic	134	Os	135	Os	136	Fm	137	Os	138	Os	139	En
139	Os	Ls	Logstash	Lg	Loggly	140	Os	141	Os	142	Fm	143	Os	144	Os	145	En
146	Os	Tr	Trello	Gr	Graylog	147	Os	148	Os	149	Os	150	Os	151	Os	152	En
153	Os	Rf	HipChat	Jr	Short	154	Os	155	Os	156	Fm	157	Os	158	Os	159	Os
159	Os	Sl	Slack	Fd	Flowdock	160	Os	161	Fm	162	Fm	163	Fm	164	Pd	165	En
166	Os	Tr	Tripwire	Cy	CyberArk	167	Os	168	Os	169	Os	170	Os	171	Os	172	En
173	Os	Sn	ServiceNow	Cf	Cloud	174	Os	175	Os	176	Os	177	Os	178	Os	179	Os
179	Os	No	ElasticBox	Eb	Apprenda	180	Os	181	Os	182	Os	183	En	184	En	185	Os
185	Os	Rd	Rundeck	Cf	CFEngine	186	Os	187	En	188	En	189	Os	190	Os	191	Os
191	Os	Cy	Octopus Deploy	Oc	Octopus Deploy	192	Os	193	En	194	En	195	En	196	En	197	En
197	Os	Ca	CA Nolio	No	Ad	198	Os	199	Fm	200	Pd	201	Fm	202	Fm	203	Fm
203	Fm	Tr	Terraform	Tf	HashiCorp Terraform	204	Os	205	Os	206	Os	207	Os	208	Pd	209	En
209	Os	Va	Vagrant	Rk	Rkt	210	Os	211	Os	212	Os	213	Os	214	Os	215	Os
215	Os	Bl	BladeLogic	Hk	Heroku	216	Os	217	Os	218	Fm	219	Os	220	Os	221	En
221	Os	Ssh	SSH	Ss	SSH	222	Os	223	Os	224	Os	225	Os	226	Os	227	Os
227	Os	Ch	Chef	Dk	Docker	228	Os	229	Os	230	Os	231	Os	232	Os	233	Os
233	Os	Pu	Puppet	Az	Azure	234	Os	235	Os	236	Os	237	Os	238	Os	239	Os
239	Os	An	Ansible	Sl	Salt	240	Os	241	Os	242	Os	243	Os	244	Os	245	Os
245	Os	Tf	Terraform	Rk	Rkt	246	Os	247	Os	248	Os	249	Os	250	Os	251	Os
251	Os	Rk	Rkt	Hk	Heroku	252	Os	253	Os	254	Fm	255	Os	256	Os	257	Os
257	Os	Bl	BladeLogic	Ss	SSH	258	Os	259	Os	260	Os	261	Os	262	Os	263	En
263	En	Sf	SmartFrog	Kb	Kubernetes	264	Os	265	Os	266	Os	267	Os	268	Os	269	Os
269	Os	Cb	Cobbler	Rs	Rackspace	270	Os	271	Os	272	Os	273	Os	274	Os	275	Os
275	Os	Bc	Bcfg2	Kb	Kubernetes	276	Os	277	Os	278	Os	279	Os	280	Os	281	Os
281	Os	Bd	Deployment Manager	Rs	Rackspace	282	Os	283	Os	284	Os	285	Os	286	Os	287	Os
287	Os	Gd	Deployment Manager	Cb	Cobbler	288	Os	289	Os	290	Os	291	Os	292	Os	293	Os
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305	Os	Bd	Bcfg2	Kb	Kubernetes	306	Os	307	Os	308	Os	309	Os	310	Os	311	Os
311	Os	Gd	Deployment Manager	Rs	Rackspace	312	Os	313	Os	314	Os	315	Os	316	Os	317	Os
317	Os	Sf	SmartFrog	Cb	Cobbler	318	Os	319	Os	320	Os	321	Os	322	Os	323	Os
323	Os	Cb	Cobbler	Kb	Kubernetes	324	Os	325	Os	326	Os	327	Os	328	Os	329	Os
329	Os	Bd	Bcfg2	Kb	Kubernetes	330	Os	331	Os	332	Os	333	Os	334	Os	335	Os
335	Os	Gd	Deployment Manager	Rs	Rackspace	336	Os	337	Os	338	Os	339	Os	340	Os	341	Os
341	Os	Sf	SmartFrog	Cb	Cobbler	342	Os	343	Os	344	Os	345	Os	346	Os	347	Os
347	Os	Cb	Cobbler	Kb	Kubernetes	348	Os	349	Os	350	Os	351	Os	352	Os	353	Os
353	Os	Bd	Bcfg2	Kb	Kubernetes	354	Os	355	Os	356	Os	357	Os	358	Os	359	Os
359	Os	Gd	Deployment Manager	Rs	Rackspace	360	Os	361	Os	362	Os	363	Os	364	Os	365	Os
365	Os	Sf	SmartFrog	Cb	Cobbler	366	Os	367	Os	368	Os	369	Os	370	Os	371	Os
371	Os	Cb	Cobbler	Kb	Kubernetes	372	Os	373	Os	374	Os	375	Os	376	Os	377	Os
377	Os	Bd	Bcfg2	Kb	Kubernetes	378	Os	379	Os	380	Os	381	Os	382	Os	383	Os
383	Os	Gd	Deployment Manager	Rs	Rackspace	384	Os	385	Os	386	Os	387	Os	388	Os	389	Os
389	Os	Sf	SmartFrog	Cb	Cobbler	390	Os	391	Os	392	Os	393	Os	394	Os	395	Os
395	Os	Cb	Cobbler	Kb	Kubernetes	396	Os	397	Os	398	Os	399	Os	400	Os	401	Os
401	Os	Bd	Bcfg2	Kb	Kubernetes	402	Os	403	Os	404	Os	405	Os	406	Os	407	Os
407	Os	Gd	Deployment Manager	Rs	Rackspace	408	Os	409	Os	410	Os	411	Os	412	Os	413	Os
413	Os	Sf	SmartFrog	Cb	Cobbler	414	Os	415	Os	416	Os	417	Os	418	Os	419	Os
419	Os	Cb	Cobbler	Kb	Kubernetes	420	Os	421	Os	422	Os	423	Os	424	Os	425	Os
425	Os	Bd	Bcfg2	Kb	Kubernetes	426	Os	427	Os	428	Os	429	Os	430	Os	431	Os
431	Os	Gd	Deployment Manager	Rs	Rackspace	432	Os	433	Os	434	Os	435	Os	436	Os	437	Os
437	Os	Sf	SmartFrog	Cb	Cobbler	438	Os	439	Os	440	Os	441	Os	442	Os	443	Os
443	Os	Cb	Cobbler	Kb	Kubernetes	444	Os	445	Os	446	Os	447	Os	448	Os	449	Os
449	Os	Bd	Bcfg2	Kb	Kubernetes	450	Os	451	Os	452	Os	453	Os	454	Os	455	Os
455	Os	Gd	Deployment Manager	Rs	Rackspace	456	Os	457	Os	458	Os	459	Os	460	Os	461	Os
461	Os	Sf	SmartFrog	Cb	Cobbler	462	Os	463	Os	464	Os	465	Os	466	Os	467	Os
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473	Os	Bd	Bcfg2	Kb	Kubernetes	474	Os	475	Os	476	Os	477	Os	478	Os	479	Os
479	Os	Gd	Deployment Manager	Rs	Rackspace	480	Os	481	Os	482	Os	483	Os	484	Os	485	Os
485	Os	Sf	SmartFrog	Cb	Cobbler	486	Os	487	Os	488	Os	489	Os	490	Os	491	Os
491	Os	Cb	Cobbler	Kb	Kubernetes	492	Os	493	Os	494	Os	495	Os	496	Os	497	Os
497	Os	Bd	Bcfg2	Kb	Kubernetes	498	Os	499	Os	500	Os	501	Os	502	Os	503	Os
503	Os	Gd	Deployment Manager	Rs	Rackspace	504	Os	505	Os	506	Os	507	Os	508	Os	509	Os
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551	Os	Gd	Deployment Manager	Rs	Rackspace	552	Os	553	Os	554	Os	555	Os	556	Os	557	Os
557	Os	Sf	SmartFrog	Cb	Cobbler	558	Os	559	Os	560	Os	561	Os	562	Os	563	Os
563	Os	Cb	Cobbler	Kb	Kubernetes	564	Os	565	Os	566	Os	567	Os	568	Os	569	Os
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575	Os	Gd	Deployment Manager	Rs	Rackspace	576	Os	577	Os	578	Os	579	Os	580	Os	581	Os
581	Os	Sf	SmartFrog	Cb	Cobbler	582	Os	583	Os	584	Os	585	Os	586	Os	587	Os
587	Os	Cb	Cobbler	Kb	Kubernetes	588	Os	589	Os	590	Os	591	Os	592	Os	593	Os
593	Os	Bd	Bcfg2	Kb	Kubernetes	594	Os	595	Os	596	Os	597	Os	598	Os	599	Os
599	Os	Gd	Deployment Manager	Rs	Rackspace	600	Os	601	Os	602	Os	603	Os	604	Os	605	Os
605	Os	Sf	SmartFrog	Cb	Cobbler	606	Os	607	Os	608	Os	609	Os	610	Os	611	Os
611																	

Almost None of These Tools are Relevant to Salesforce

Only version control, ALM/collaboration, build and CI tools are at all relevant



PERIODIC TABLE OF DEVOPS TOOLS (V1)																																		
		SCM				Build				Testing				Deployment				Continuous Integration																
		Os		Fr		Fm		Pd		En		Cl		Deployment		Cloud / IaaS / PaaS		Release Mgmt		Monitoring		Coding		CI / CD		Containerization		Automation		Integration				
O	Sc	Git	Hg	SVN	Subversion	hg4	Mercurial	git	SVN	git	SVN	git	git	Jenkins	Bamboo	Travis CI	Acumos	Gerrit	Selenium	Gn	Gd	Sf	Cb	Bc	Kb	Rs	Az	Docker	Aws	Cloud Foundry				
M	Sc	Gr	Mr	Gr	Grade	Gr	Mercurial	Gr	Mr	Gr	Mr	Gr	Gr	Jenkins	Bamboo	Travis CI	Acumos	Gerrit	Selenium	Gn	Gd	Sf	Cb	Bc	Kb	Rs	Az	Docker	Aws	Cloud Foundry				
Al	Sc	Gr	Mr	Gr	Grade	Gr	Mercurial	Gr	Mr	Gr	Mr	Gr	Gr	40	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58			
Mg	Sc	Br	At	Br	Bm	Br	Github	Br	At	Br	Bm	Br	Br	Cs	Sn	Cr	Nx	Cu	Cj	Qu	Cp	Ju	Rd	Cf	Pk	Bx	Rs	Az	Docker	Aws	Cloud Foundry			
Ca	Sc	Br	At	Br	Bm	Br	Github	Br	At	Br	Bm	Br	Br	Cs	Sn	Cr	Nx	Cu	Cj	Qu	Cp	Ju	Rd	Cf	Pk	Bx	Rs	Az	Docker	Aws	Cloud Foundry			
Sc	Sc	Ub	Ta	Ub	UrbanCode	Ub	UrbanCode	Sc	Ub	Ta	Ub	Ub	Sc	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77			
Db	Sc	Bb	Tc	Sh	Shipable	Sc	Shipable	Sc	Bb	Tc	Sh	Sc	Sc	Qb	Ub	Ta	Tc	Sh	Ay	Ju	Jm	Tn	Rd	Cy	Oc	No	Eb	Ad	Rs	Az	Docker	Aws	Cloud Foundry	
Cr	Sc	Bb	Tc	Sh	Shipable	Sc	Shipable	Sc	Bb	Tc	Sh	Sc	Sc	Qb	Ub	Ta	Tc	Sh	Ay	Ju	Jm	Tn	Rd	Cy	Oc	No	Eb	Ad	Rs	Az	Docker	Aws	Cloud Foundry	
Cs	Sc	Hx	Msb	Rk	Lb	Sc	Helix	Sc	Hx	Msb	Rk	Sc	Sc	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95			
Sc	Sc	Xlr	Ur	Ls	Bm	Hp	Ex	Pl	Sr	Tr	Jr	Rf	Sl	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	
Sc	Sc	Sp	Ki	Nr	Ni	Gg	Ct	Gr	Ic	Sl	Ls	Lg	Gr	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	
Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc
Source: https://digital.ai/periodic-table-of-devops-tools/																																		

DevOps Team Assumptions vs. Salesforce Reality

- Developers can all use Git
- The application is totally defined by its files
- Files can easily be merged using Git
- Comprehensive build scripts are available
- Build, test, and deploy jobs run quickly
- You can build, run, and test the application on any computer
- You can define and create an environment to run your application

In short ...



Environments



Salesforce controls the underlying environments

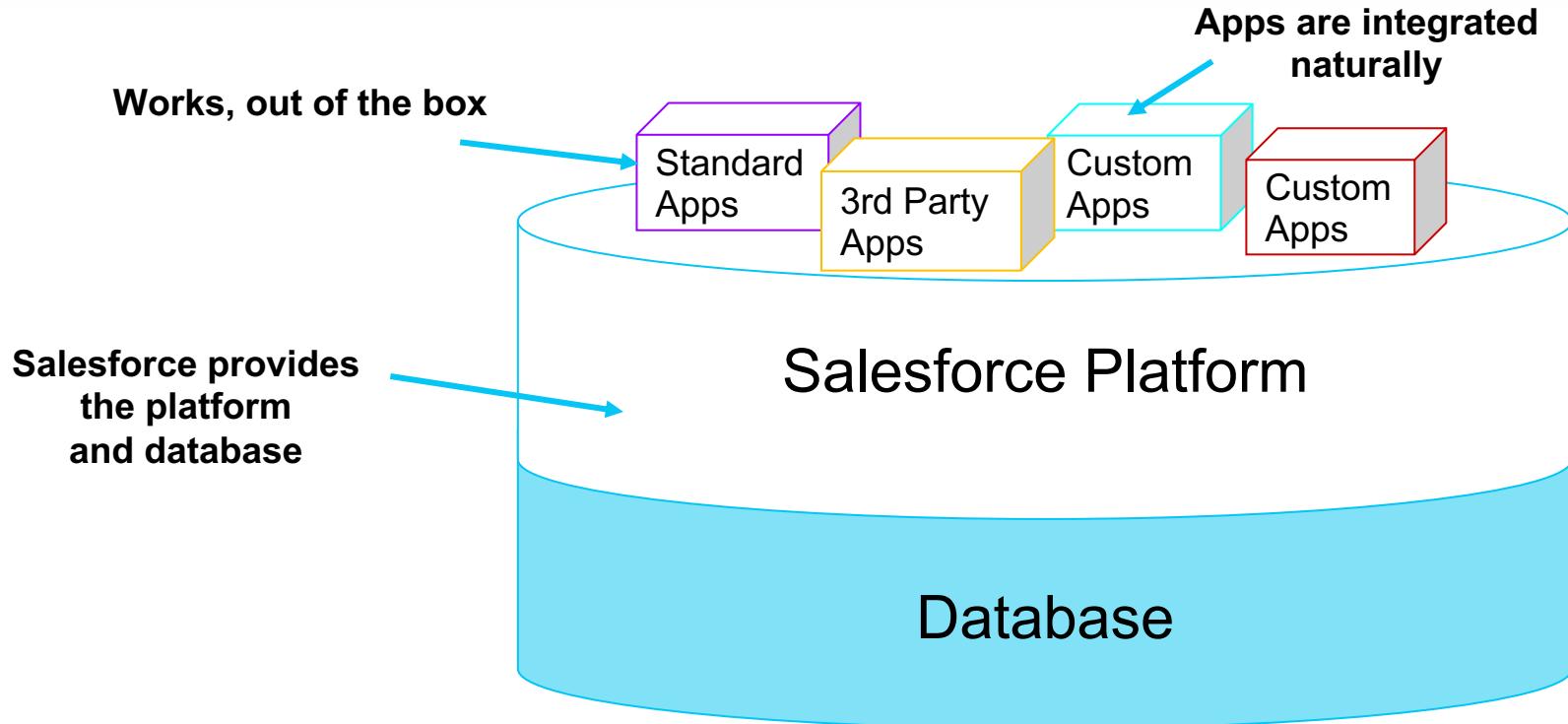
Production Orgs
Hosted by Salesforce

Long-lived Sandboxes
Hosted by Salesforce

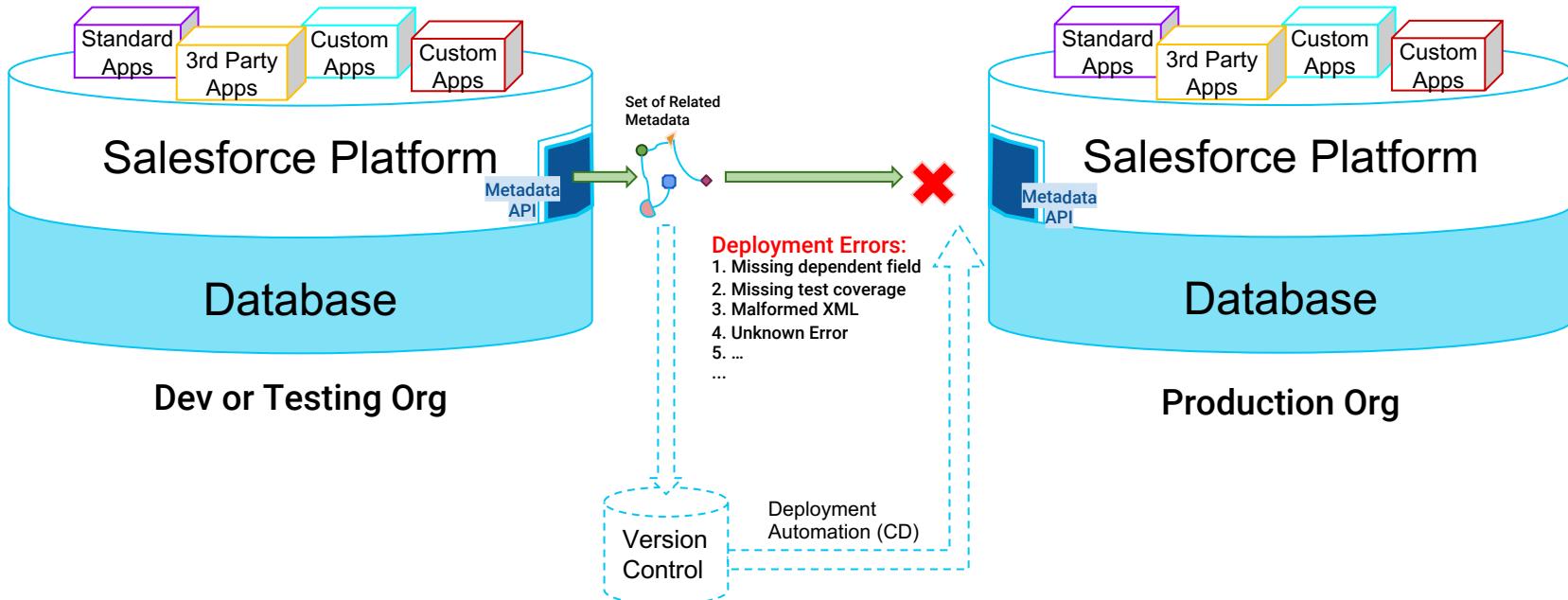
Short-lived Scratch Orgs
Hosted by Salesforce. Can be used in limited situations



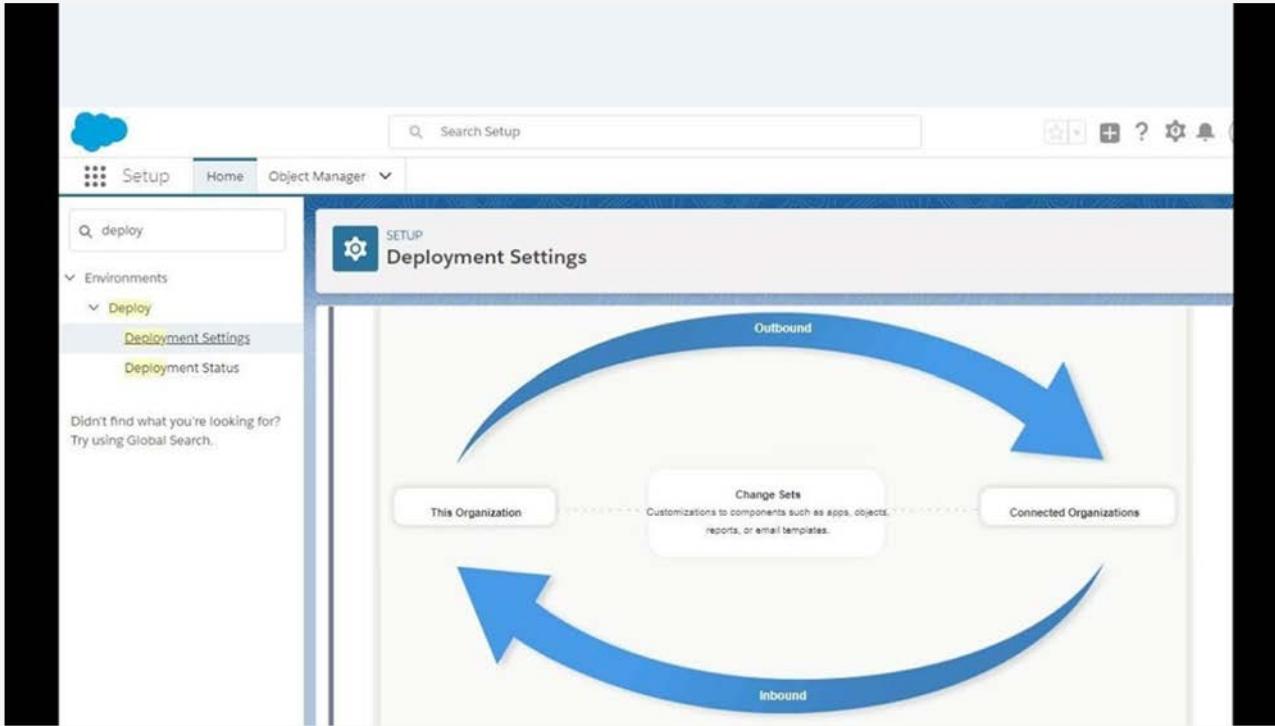
Each Salesforce instance is a monolithic database



The Metadata API is the only gateway for deployments



The Default Method to Move Changes: Change Sets



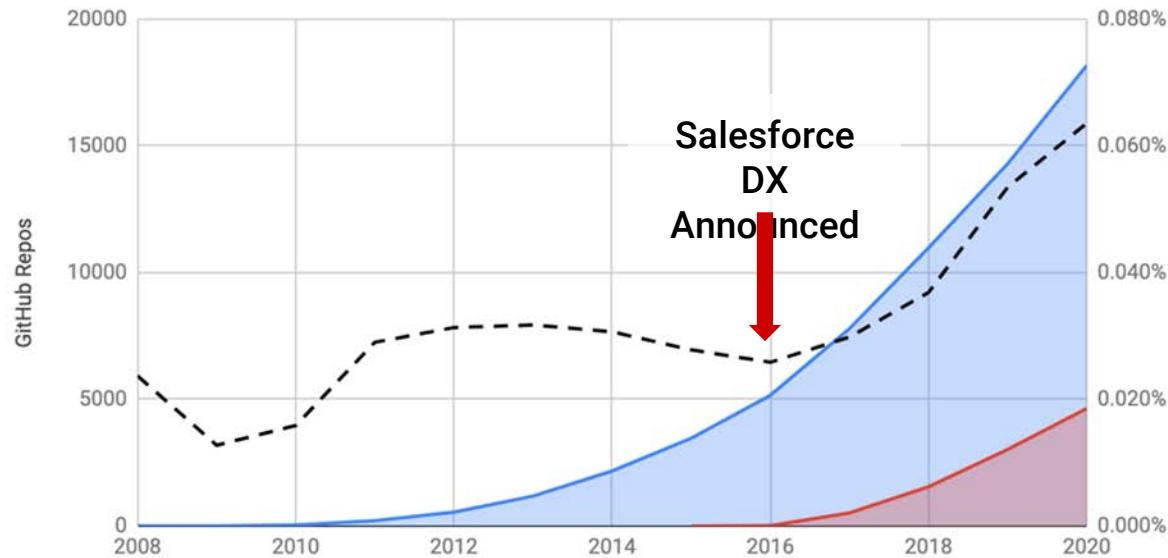
Salesforce DX (Development Experience)

- Moonshot project announced in 2016, launched in 2017
- Increased funding for developer tooling teams
- Improved API support
- Visual Studio Code as the IDE of choice
- New command line interface
- New type of ephemeral environment: scratch orgs
- Packaging for enterprises
- Easier change tracking

DevOps scripting is spurring Salesforce open source growth

Growth in Salesforce-related GitHub repos

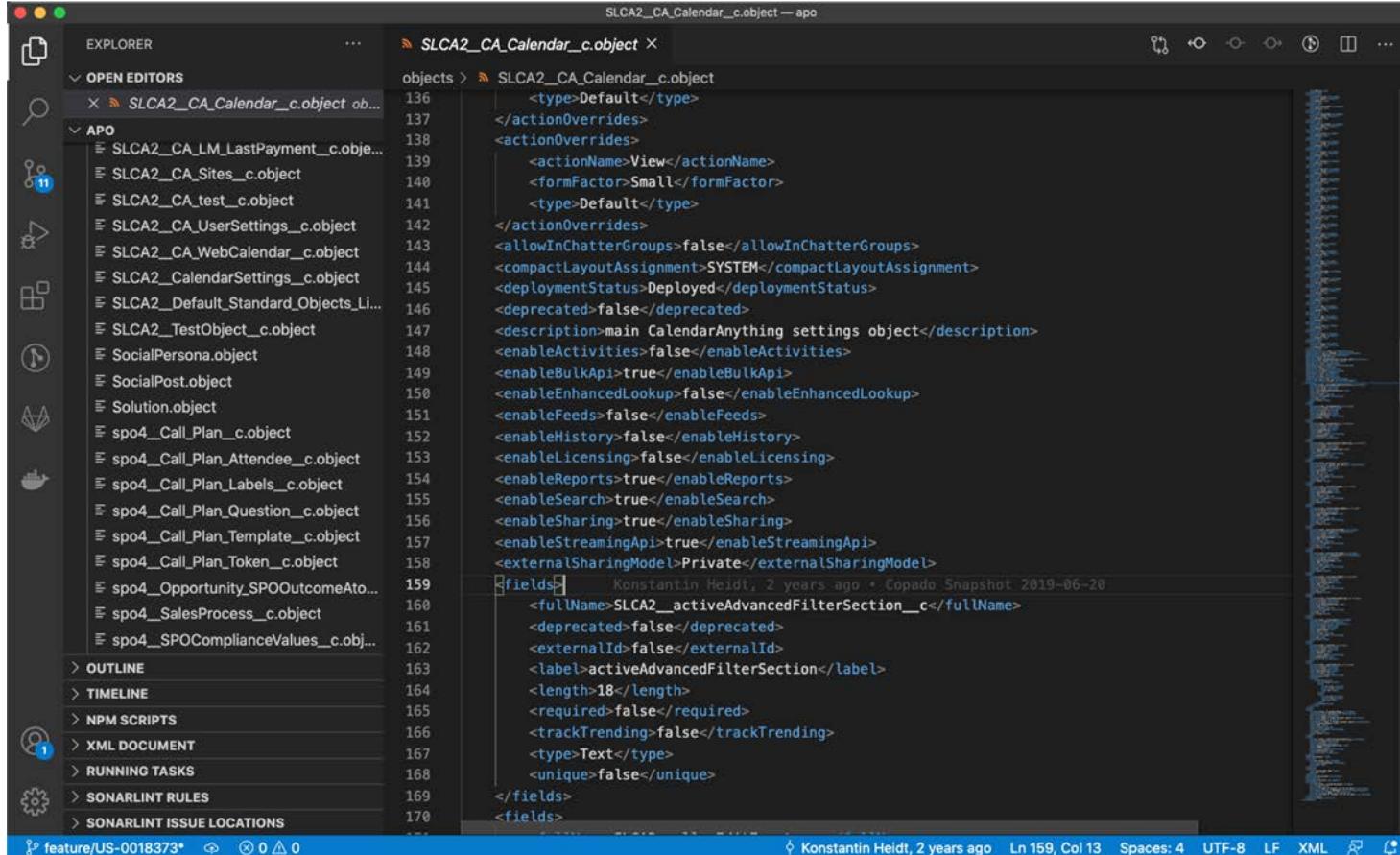
■ GitHub Repos mentioning "Salesforce" ■ GitHub Repos mentioning "sfdx"
— — Salesforce repos as a proportion of all GitHub repos



How Salesforce Scripts Work



Salesforce Metadata Behind the Scenes



The screenshot shows the SonarLint IDE interface with the following details:

- EXPLORER** panel on the left:

 - OPEN EDITORS**: SLCA2__CA_Calendar_c.object
 - APO**: A list of custom objects including SLCA2__CA_LM_LastPayment_c, SLCA2__CA_Sites_c, SLCA2__CA_test_c, SLCA2__CA_UserSettings_c, SLCA2__CA_WebCalendar_c, SLCA2__CalendarSettings_c, SLCA2__Default_Standard_Objects_Li..., SLCA2__TestObject_c, SocialPersona, SocialPost, Solution, spo4_Call_Plan_c, spo4_Call_Plan_Attendee_c, spo4_Call_Plan_Labels_c, spo4_Call_Plan_Question_c, spo4_Call_Plan_Template_c, spo4_Call_Plan_Token_c, spo4_Opportunity_SPOOutcomeAto..., spo4_SalesProcess_c, and spo4_SPOComplianceValues_c.
 - OUTLINE**, **TIMELINE**, **NPM SCRIPTS**, **XML DOCUMENT**, **RUNNING TASKS**, **SONARLINT RULES**, and **SONARLINT ISSUE LOCATIONS**.

- SLCA2__CA_Calendar_c.object** editor on the right:

 - Content: XML code for the SLCA2__CA_Calendar_c object.
 - Line numbers: 136 to 170.
 - Annotations: A tooltip for the `fields` element at line 159 indicates it was last modified by Konstantin Heidt on 2019-06-20.
 - Bottom status bar: feature/US-0018373*, 0 △ 0, Konstantin Heidt, 2 years ago, Ln 159, Col 13, Spaces: 4, UTF-8, LF, XML, co.



Salesforce XML must be parsed to be merged properly

```
1  <xml_merge>
2  |   <how/>
3  |   <hard/>
4  |   <could/>
5  |   <it/>
6  |   <be/>
7  </xml_merge>
```



```
1  <xml_merge>
2  |   <you/>
3  |   <dont/>
4  |   <want/>
5  |   <to/>
6  |   <know/>
7  </xml>
```



```
1  <xml_merge>
2  |   <how/>
3  |   <you/>
4  |   <hard/>
5  |   <dont/>
6  |   <could/>
7  |   <want/>
8  |   <it/>
9  |   <to/>
10 |   <be/>
11 |   <know/>
12 </xml>
```

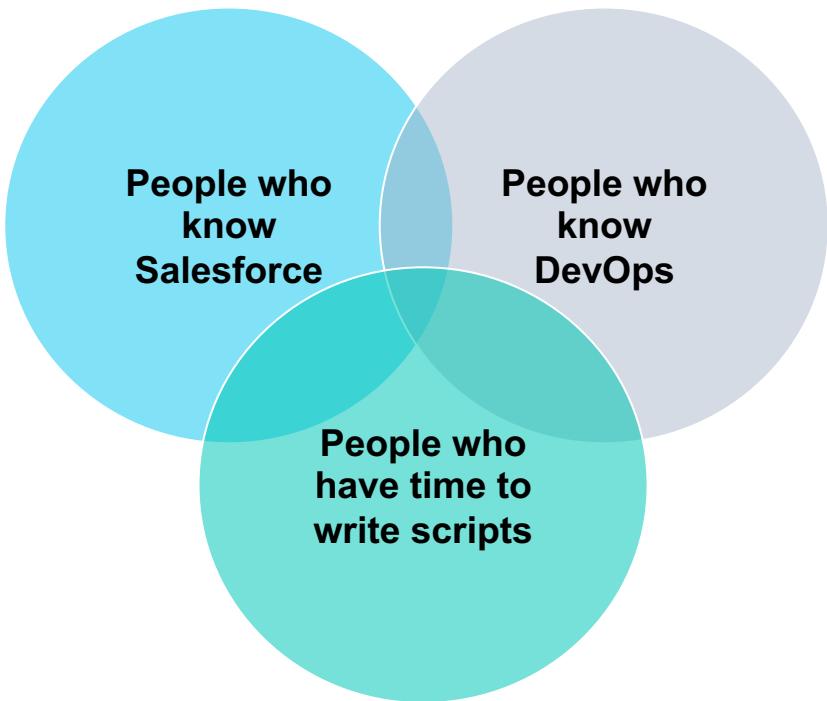
Performing a small Git merge in Salesforce



Performing a large Git merge in Salesforce



The limiting factor on homegrown Salesforce DevOps tools



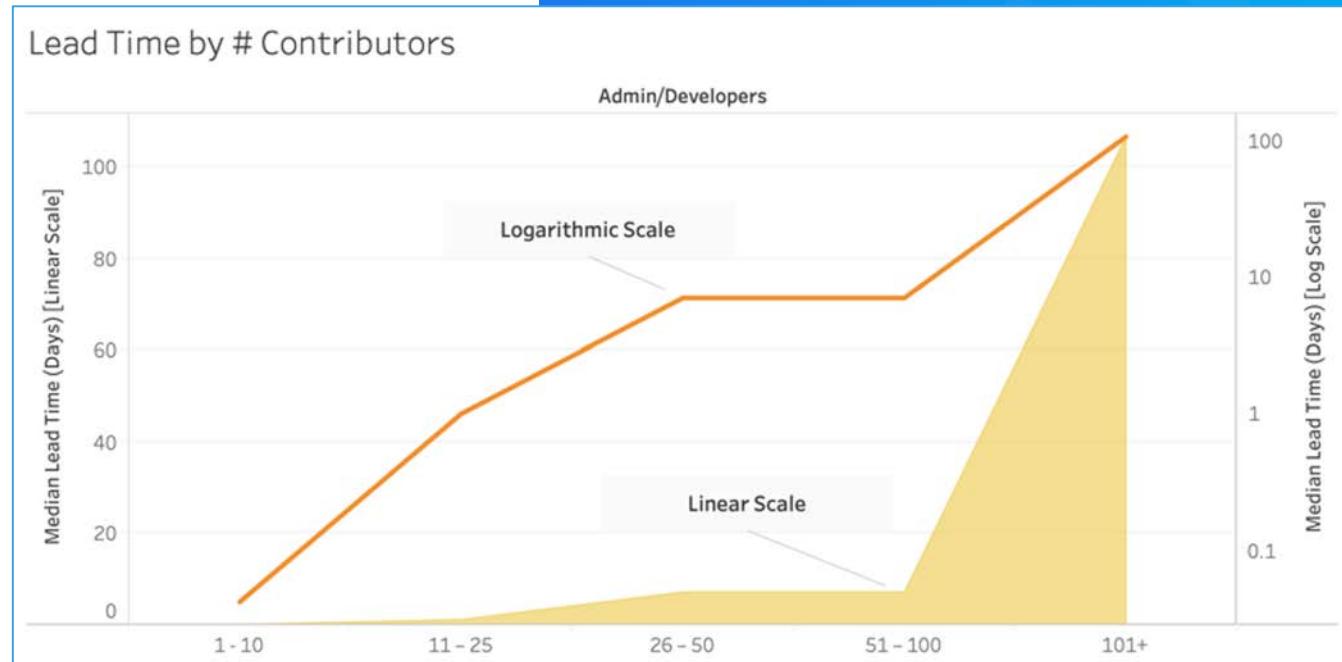
State of Salesforce DevOps Reports

- Conclusions
 - Technical practices of DevOps are **less mature** vs. broader IT industry
 - But software delivery performance is **comparable**
- Why?
 - Salesforce is inherently stable and fast
- But
 - Teams struggle as they get bigger



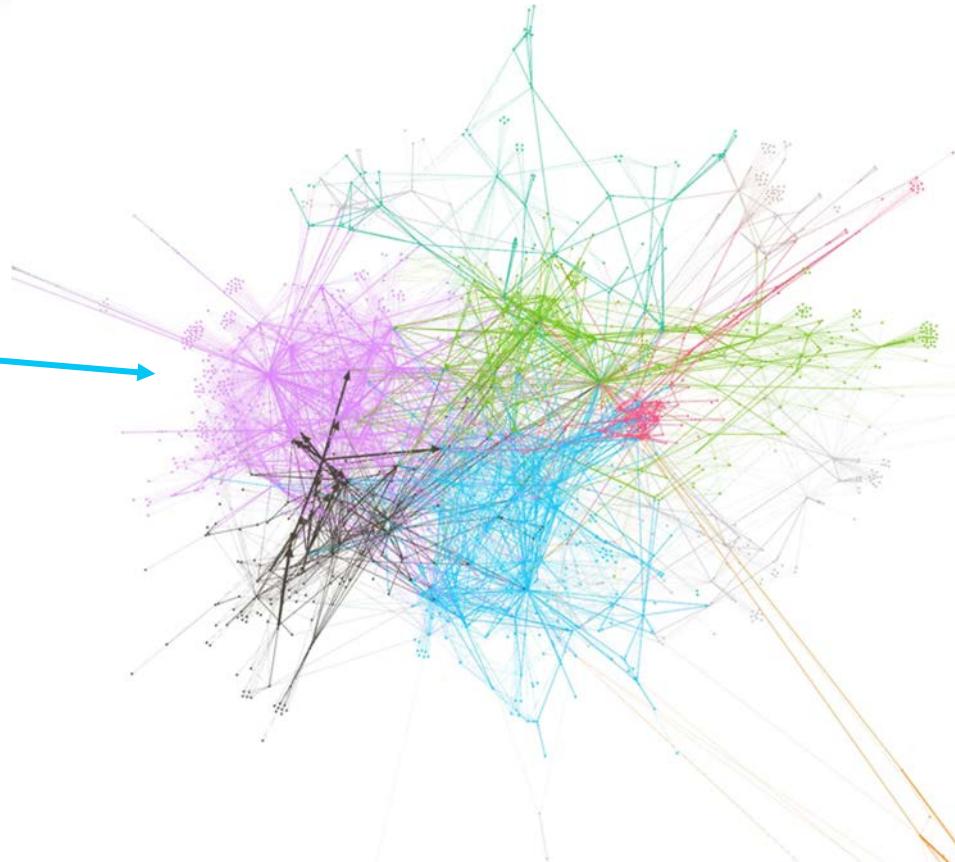
Main Conclusions

Companies struggle as they get bigger.
Especially with Lead Time

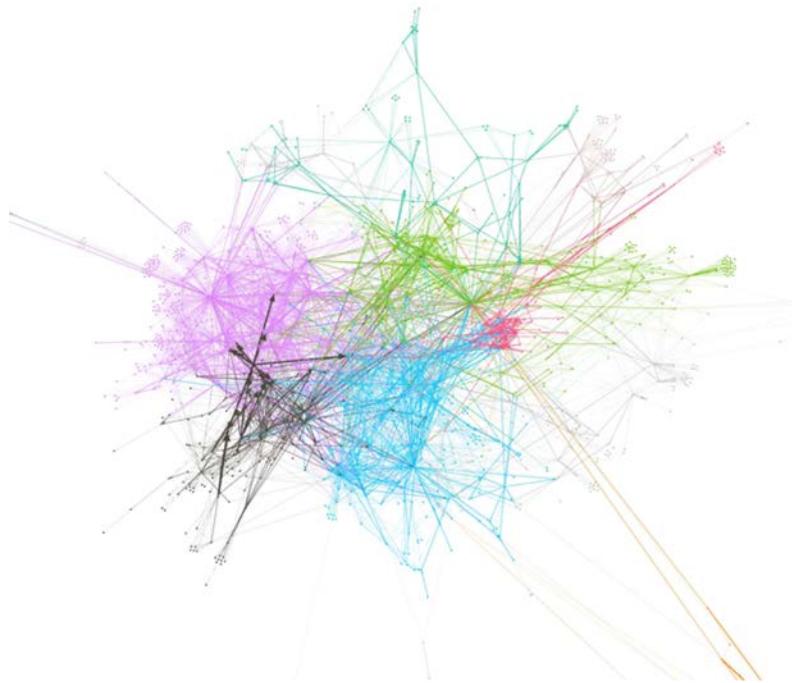


Metadata tends to be tightly coupled

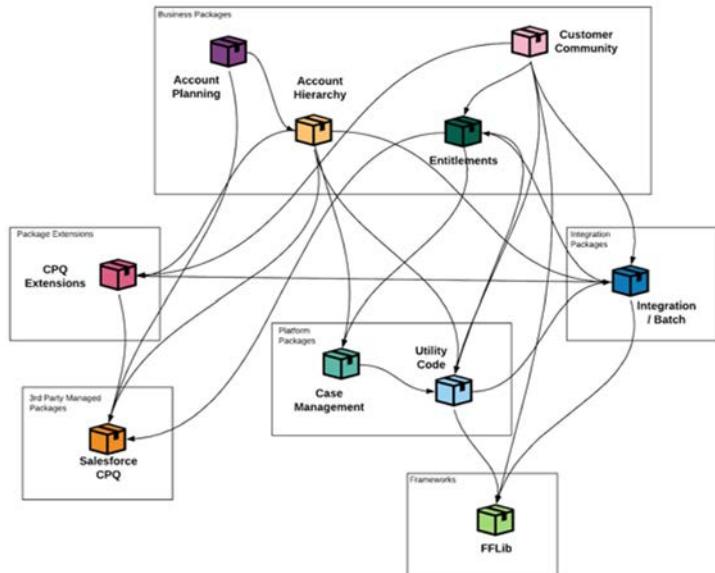
Components become highly interdependent



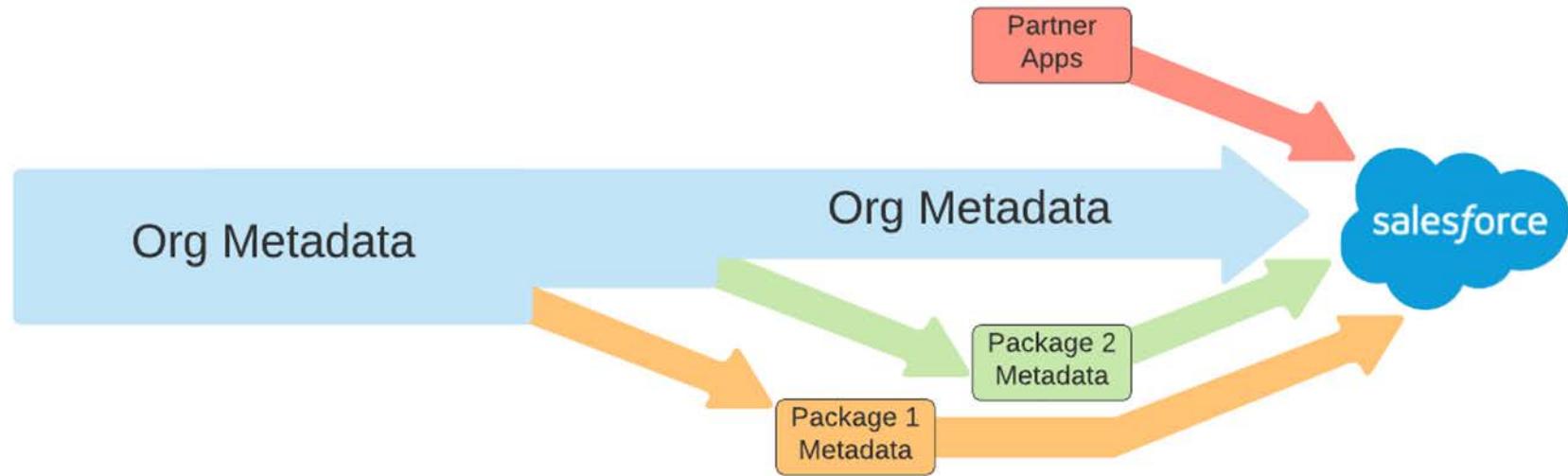
Salesforce “unlocked packages” promise modularization



Proposed Packaging Structure



The goal of packaging: Reduce complexity



But the obstacles to packaging are *Legion*

Requires **refactoring** much of the codebase

No immediate value add (hard to get **investment** buy-in)

Requires **sophisticated** software engineering

Development **environments** (scratch orgs) can be hard to provision

Package **dependencies** become tricky

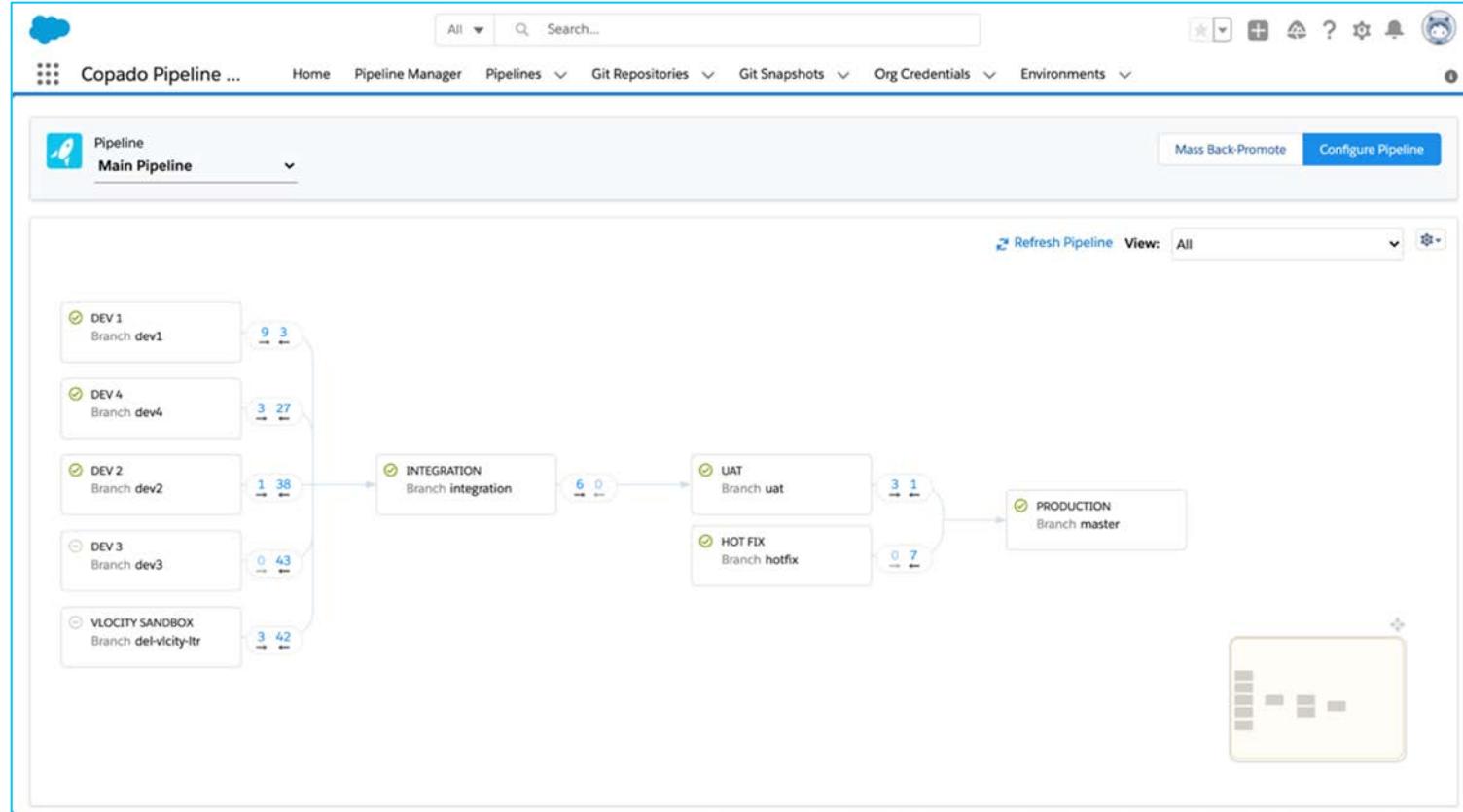
Multi-pipeline builds become required

Why commercial DevOps tools for Salesforce

- GUI for Salesforce admins to track their work in version control
- GUI for managing flow of changes
- Intelligent Salesforce metadata handling
- Deploying complex configuration data
- Tools for reporting and team collaboration
- Some (ex: Copado) are customizable Salesforce apps

Collaboration: Centralize on a Common Platform

The Salesforce Platform is a perfect place for DevOps collaboration too!!



Track metrics on your value stream

Value stream management is now on Salesforce

The screenshot displays the COPADO DevOps 360 interface. At the top, there's a navigation bar with links for DevOps 360, Dashboards, DevOps Analytics, Value Stream Maps, Reports, User Stories, and DevOps 360 Setup. A search bar and user profile icons are also present.

The main area shows a summary card for "My DevOps Process" (Created Date: 7/7/2020). It includes metrics like Object User Story, Record Type User_Story, Active Yes, Last Execution 4/22/2021, 09:00 PM, Rolled % C/A 23%, Total Cycle Time 7d 18h, Total Idle Time 2M 22h, Total Lead Time 2M 8d 16h, Total Work Items in Progress 31, and Business Value \$212000.00. There's also a "Configure Value Stream" button.

Below the summary card is a detailed view of the value stream stages:

- DEFINE & PLAN:**
 - Design and Refinement: 1d 9h, 4 tasks, 2 done, 1 in progress. Metrics: Lead Time 4d 8h, Cycle Time 2d 23h, % C/A 40.00%, Business Value \$12000.00.
 - Front End Development: 1d 4h, 5 tasks, 4 done, 1 in progress. Metrics: Lead Time 2d 9h, Cycle Time 1d 5h, % C/A 50.00%, Business Value \$12500.00.
 - Back End Development: 0 tasks, 0 done, 0 in progress. Metrics: Lead Time 1d 4h, Cycle Time 0h, % C/A 100%, Business Value \$0.00.
- BUILD:**
 - Automated QA: 1M 25d 8h, 4 tasks, 2 done, 1 in progress. Metrics: Lead Time 1M 28d 9h, Cycle Time 3d 1h, % C/A 100.00%, Business Value \$4000.00.
 - Manual QA: 1M 25d 8h, 0 tasks, 0 done, 0 in progress. Metrics: Lead Time 1M 25d 8h, Cycle Time 0h, % C/A 100%, Business Value \$0.00.
- TEST:**
 - Deploy & Release: 3d 1h, 5 tasks, 5 done. Metrics: Lead Time 4d 4h, Cycle Time 1d 3h, % C/A 100.00%, Business Value \$13500.00.
- RELEASE:**
 - No specific details shown for this stage.

At the bottom left, there's a "Feed" button.

Want to Learn More?

Search for “DevOps” on Salesforce’s [trailhead.com](#)

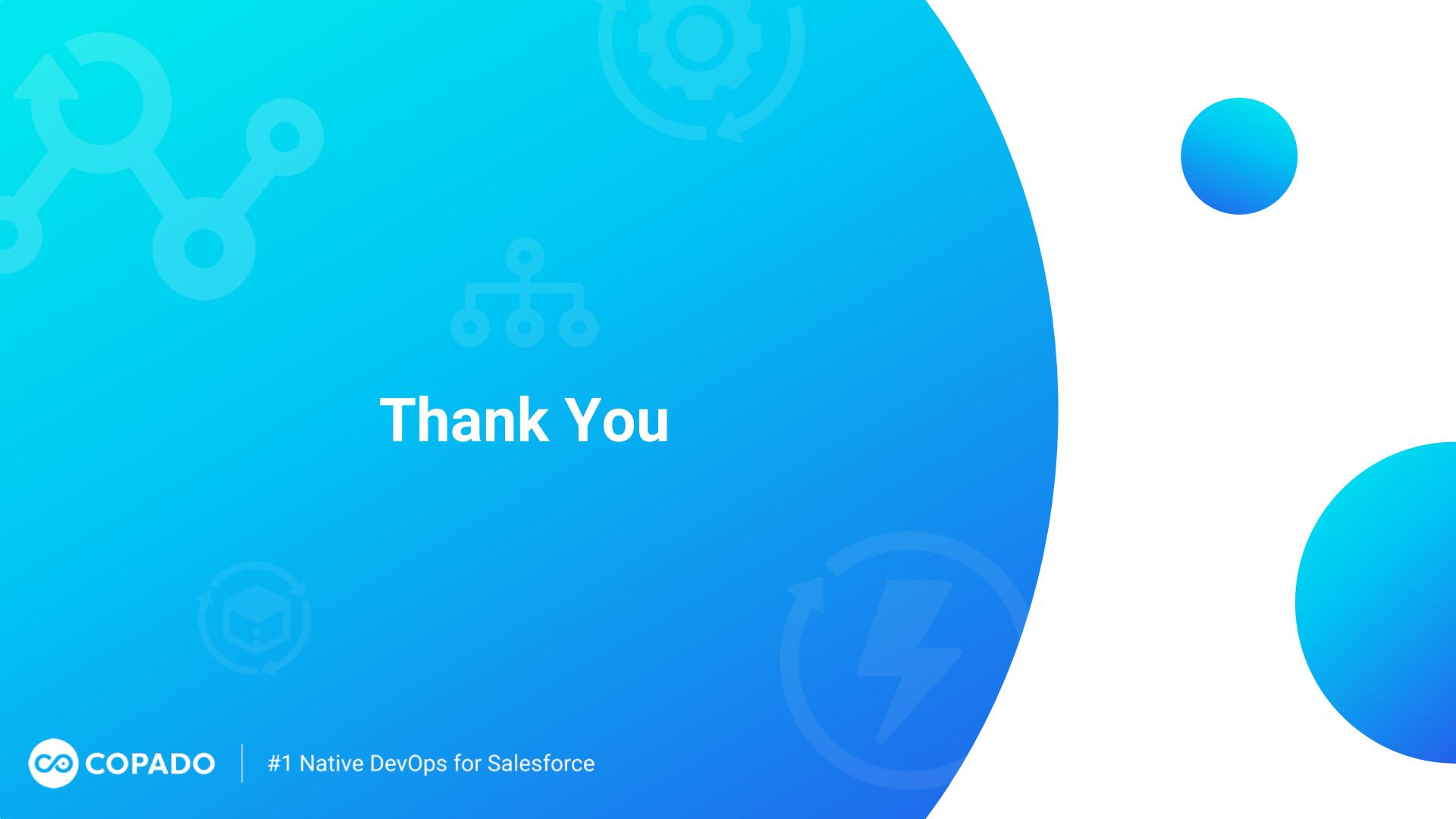
The screenshot shows the Trailhead website interface. At the top, there's a search bar with placeholder text "Search for modules, trails, and more...". Below the search bar are navigation links: Home, Learn (with a dropdown arrow), Credentials (with a dropdown arrow), Community (with a dropdown arrow), For Companies (with a dropdown arrow), and COVID-19 (with a dropdown arrow). On the right side of the header, there's a user profile for "Andrew Davis" showing "56 badges, 33,375 points".

The main content area displays two sponsored content modules:

- Salesforce DevOps and Continuous Innovation with Copado**
Sponsored content: Discover the big ideas in DevOps and make your Salesforce development process faster and more reliable.
+1,000 Points
- Module**
Salesforce DevOps with Copado
Sponsored content: Learn Copado's take on how DevOps helps you deliver innovation faster with less risk.
+500 POINTS
Completed 8/12/20
- Module**
Continuous Innovation with Copado
Sponsored content: Gather feedback, build a generative culture, and optimize your development process.
+500 POINTS
Completed 8/12/20

The Help I Need

- Let me know your experience working on Salesforce
- Are you working on solutions for delivering changes on other low-code platforms? If so, what are the challenges there?



Thank You