



# Open Source Software in eGov

# Policy of GoI on adoption of OSS

The “Policy on Adoption of Open Source Software for Government of India” (hereinafter referred to as “Policy”) will encourage the formal adoption and use of Open Source Software (OSS) in Government Organizations.

# Objectives of the Policy

- To provide a policy framework for rapid and effective adoption of OSS
- To ensure strategic control in e-Governance applications and systems from a long-term perspective.
- To reduce the Total Cost of Ownership (TCO) of projects.

# Policy Statement

**Government of India shall endeavor to adopt Open Source Software in all e-Governance systems implemented by various Government organizations, as a preferred option in comparison to Closed Source Software (CSS).**



## Infrastructure Tools

### Open Stack

Future cloud computing

### Server OS

CentOS, Ubuntu, Debian, BOSS

### NGINX

HTTP Server/IMAp/POP3 Proxy

### Apache ZooKeeper

Configuration management

### ANSIBLE...

Data center orchestration

### Open NMS, Nagios...

Network monitoring

## App Development & Deployment

HTML, JavaScript, jQuery  
Client-side Programming Language

Node.js, Express.js  
Application Server

PostgreSQL, MariaDB, MySQL  
Relational Database

React.js, Vue.js, Polymer.js, Ember.js, Bootstrap.js...  
C3.js, D3.js, dc.js ...  
Client Side Framework

Apache CXF, Tomcat, Symfony  
Web Service Framework

CakePHP, Laravel, CodeIgnitor  
PHP Web Service framework



Introduction to Client-Side Development

## Mobile App Development, Data management, GIS, Devops

Apache cordova, Ionic, Android studio  
Mobile App development

**Map Server, Geo Server**  
GIS Server

Apache Maven, Gradle, Webpack  
Build Tool

**Quantum GIS, GvSIG, GRASS**  
GIS desktop

**Tuleap, Jerrit, Jenkin**  
DevOps

Apache Cassandra, Hbase, Hadoop, CouchDB  
Big Data

## App Support

Eclipse, Netbeans, Visual studio  
IDE

**Moodle**  
e-learning

Git, Subversion  
Source Code Control

**Dspace**  
Digital Archiving

Libreoffice, Openoffice  
Documentation

Qunit, Junit, Jmeter, W3C Validator  
Testing

# OSS Support Tools

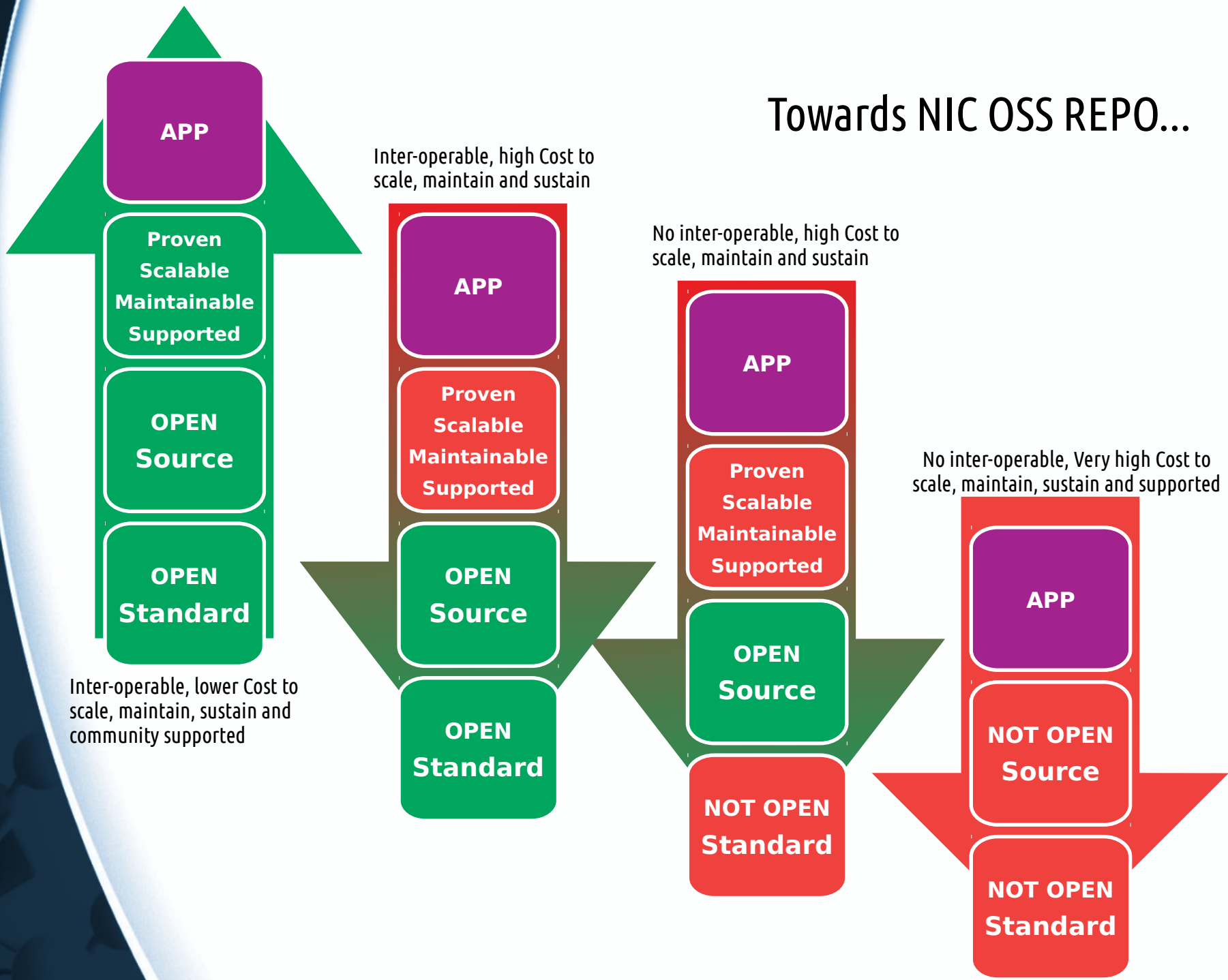
Imaging Tools  
Office productivity tools  
Diagramming tools  
Audio tools  
Video tools  
Antivirus  
Education  
Email  
File Transfer  
Games  
2D/3D graphics software  
Groupware  
HTML editors  
Image galleries  
Instant messengers  
Internet forum software  
IRC clients  
Learning support software  
Mathematics software  
Media players  
Multimedia codecs, containers, and splitters

...

PDF software  
Personal information managers  
Project management software  
Science software  
Search engine software  
Special purpose file systems  
Spreadsheets  
System software  
Television software  
TeX software  
Text editors  
Usenet clients  
Version control software  
Video software  
VoIP software  
Web browsers  
Windowing systems  
Word processors  
X window managers

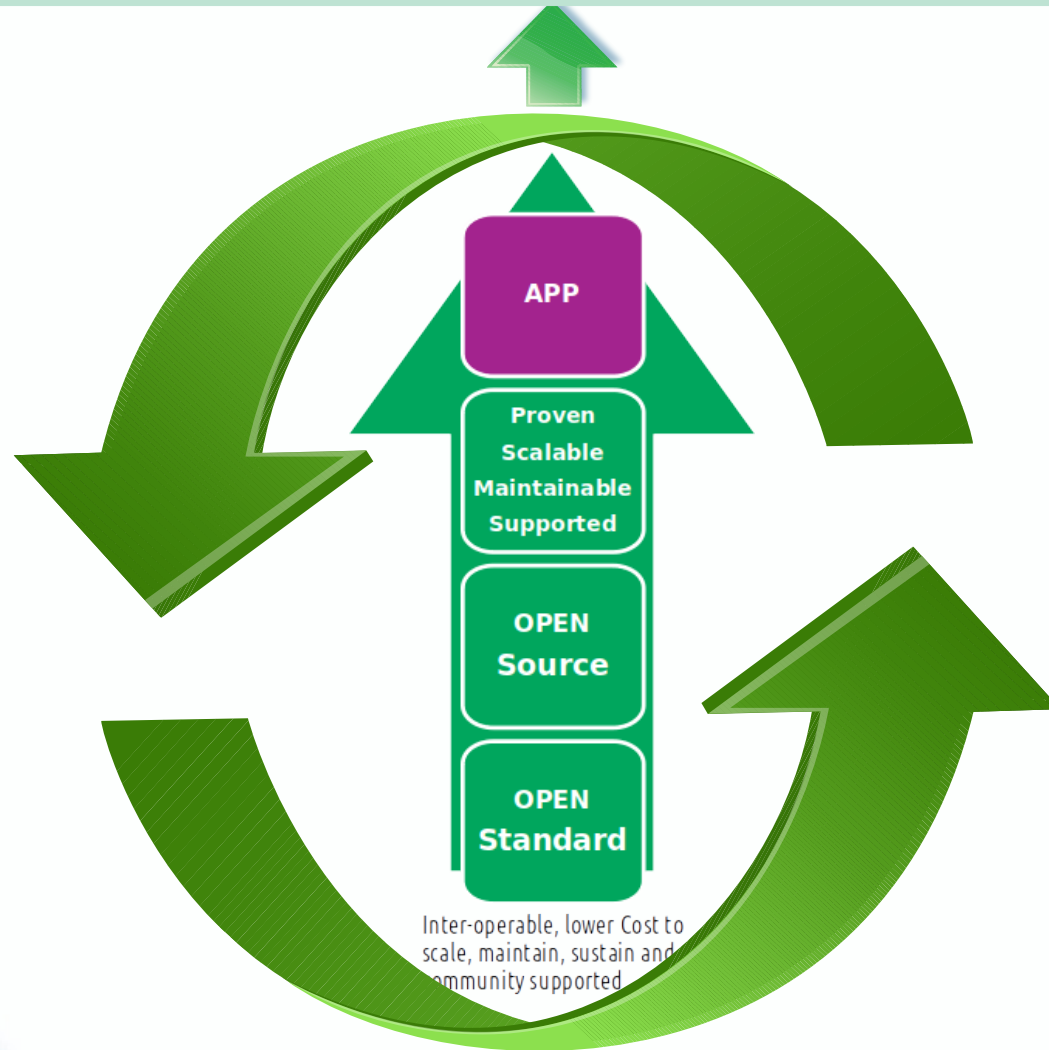
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# Towards NIC OSS REPO...





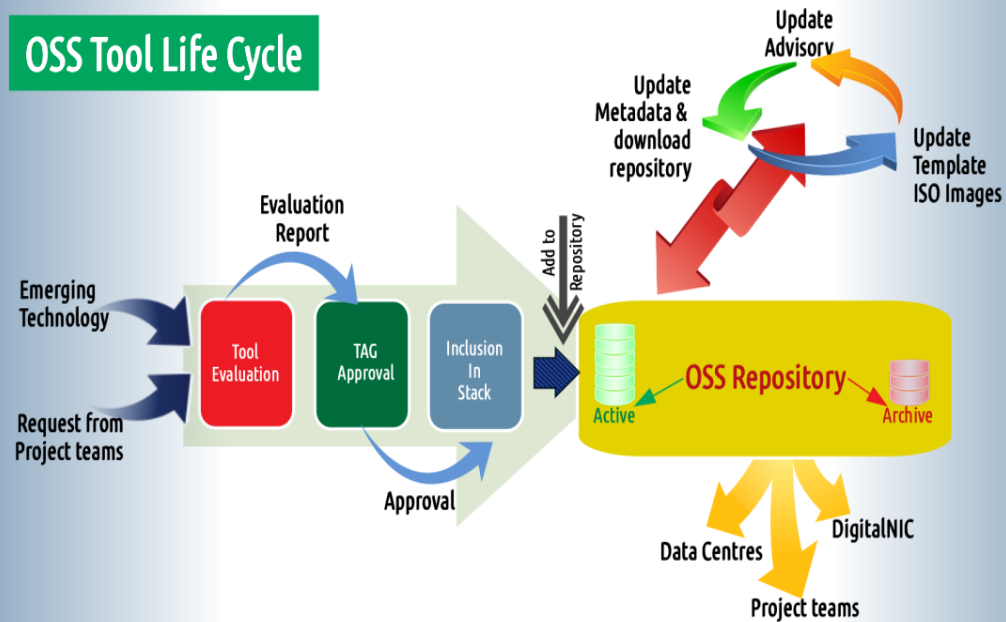
# NIC Open Source Software Repository



# NIC Open Source Software Tool Life Cycle

Tools approved as per the OSS Stack are already available. New tool can be evaluated by the project teams/OTG and submitted to TAG for inclusion in the Stack

## OSS Tool Life Cycle



Metadata updation and downloads are continuous processes which involve referring community site for updates/ upgrades/ end of life/ license check/ release notes analysis etc.

# NIC Open Source Software Repository

- Evaluate and Recommend the open source software for e-Governance Solutions.
- Maintain Distribution Repository of recommended open source software for usage across NIC.
- Guide and handhold NIC teams in keeping their open source driven system secure.
- Training on Open Source Software.
- Oversight of open source Infrastructure across NIC with respect to Cyber Security

# Open Source Software Repository

Evaluate and Recommend ~ OSS Survey 2017-18 Themes

- OSS vs Non OSS
- App Server Statistics
- Web Server Statistics
- Operating System Statistics
- Programming Language
- Portal/ CMS Statistics
- Web Application Statistics
- Integrated Development Environment
- Database Statistics
- Critical Performance Analysis
- Mobile App Analysis

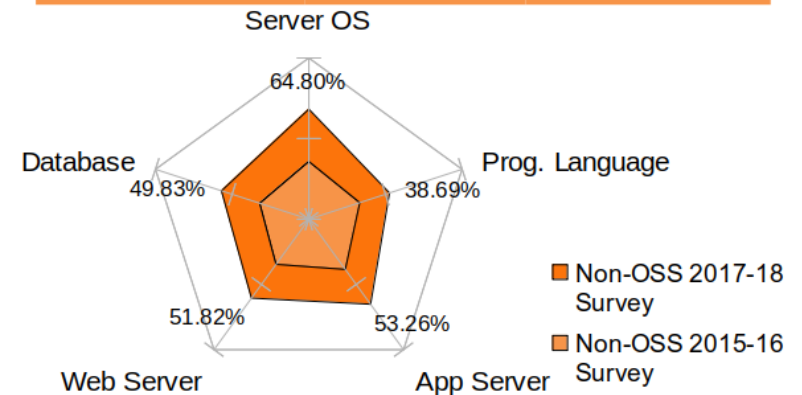
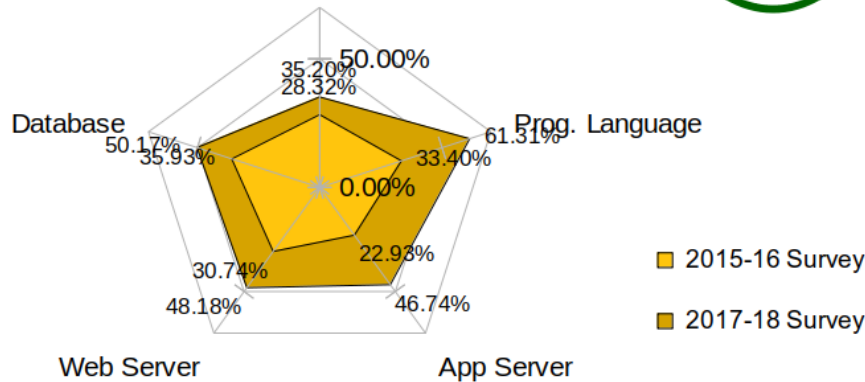
# Open Source Software Repository

Evaluate and Recommend ~ OSS Survey 2017-18

## OSS Adoption Growth during 2015-2018

Domain	OSS%		OSS Adoption Growth %
	2015-16 Survey	2017-18 Survey	
Server OS	28.32%	35.20%	<b>6.88%</b>
Database	35.93%	50.17%	<b>14.24%</b>
Web Server	30.74%	48.18%	<b>17.44%</b>
App Server	22.93%	46.74%	<b>23.80%</b>
Prog. Language	33.40%	61.31%	<b>27.90%</b>

Domain	Non-OSS %	
	2015-16 Survey	2017-18 Survey
Server OS	71.68%	64.80%
Database	64.07%	49.83%
Web Server	69.26%	51.82%
App Server	77.07%	53.26%
Prog. Language	66.60%	38.69%



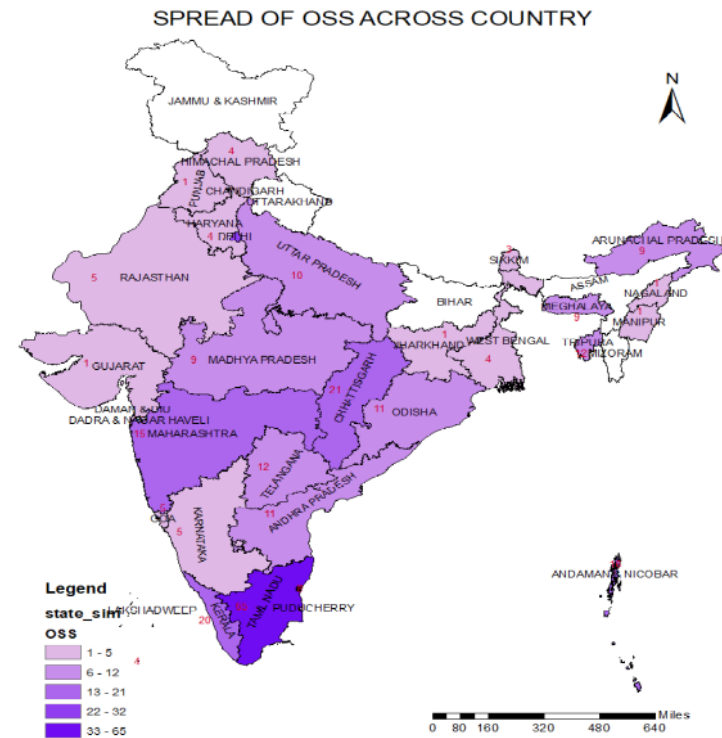
The percentage of adoption increased after the announcement of "Policy on Adoption of OSS for GoI" in 2015 and growth in all domains including Programming Languages, Application Server, Web Server, Database and Server OS.

# Open Source Software Repository

Evaluate and Recommend ~ OSS Survey 2017-18

## State-wise OSS adoption in atleast one domain

State	OSS*	State	OSS*
Andaman & Nicobar	16	Maharashtra	15
Andhra Pradesh	11	Manipur	1
Arunachal Pradesh	9	Meghalaya	9
Chandigarh	1	Nagaland	1
Chhattisgarh	21	Odisha	11
Delhi	32	Puducherry	8
Goa	5	Punjab	1
Gujarat	1	Rajasthan	5
Haryana	4	Sikkim	3
Himachal Pradesh	4	Tamil Nadu	65
Jharkhand	1	Telangana	12
Karnataka	5	Tripura	12
Kerala	20	Uttar Pradesh	10
Lakshadweep	4	Uttarakhand	
Madhya Pradesh	9	West Bengal	4



OSS adoption is significant in Tamil Nadu, Delhi, Chhattisgarh, Kerala, Andaman & Nicobar, Maharashtra, Telugana, Tripura, Andra Presdesh, Odisha and Uttar Pradesh.

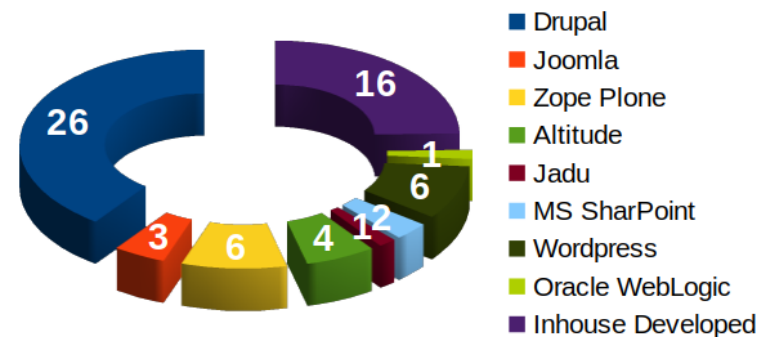
OSS National Survey Results (Dec 2017 – Mar 2018)

# Open Source Software Repository

Evaluate and Recommend ~ OSS Survey 2017-18

## Portal / CMS Statistics

CMS	Nos	%
Drupal	26	40.00%
Joomla	3	4.62%
Zope Plone	6	9.23%
Altitude	4	6.15%
Jadu	1	1.54%
MS SharPoint	2	3.08%
Wordpress	6	9.23%
Oracle WebLogic	1	1.54%
Inhouse Developed	16	24.62%

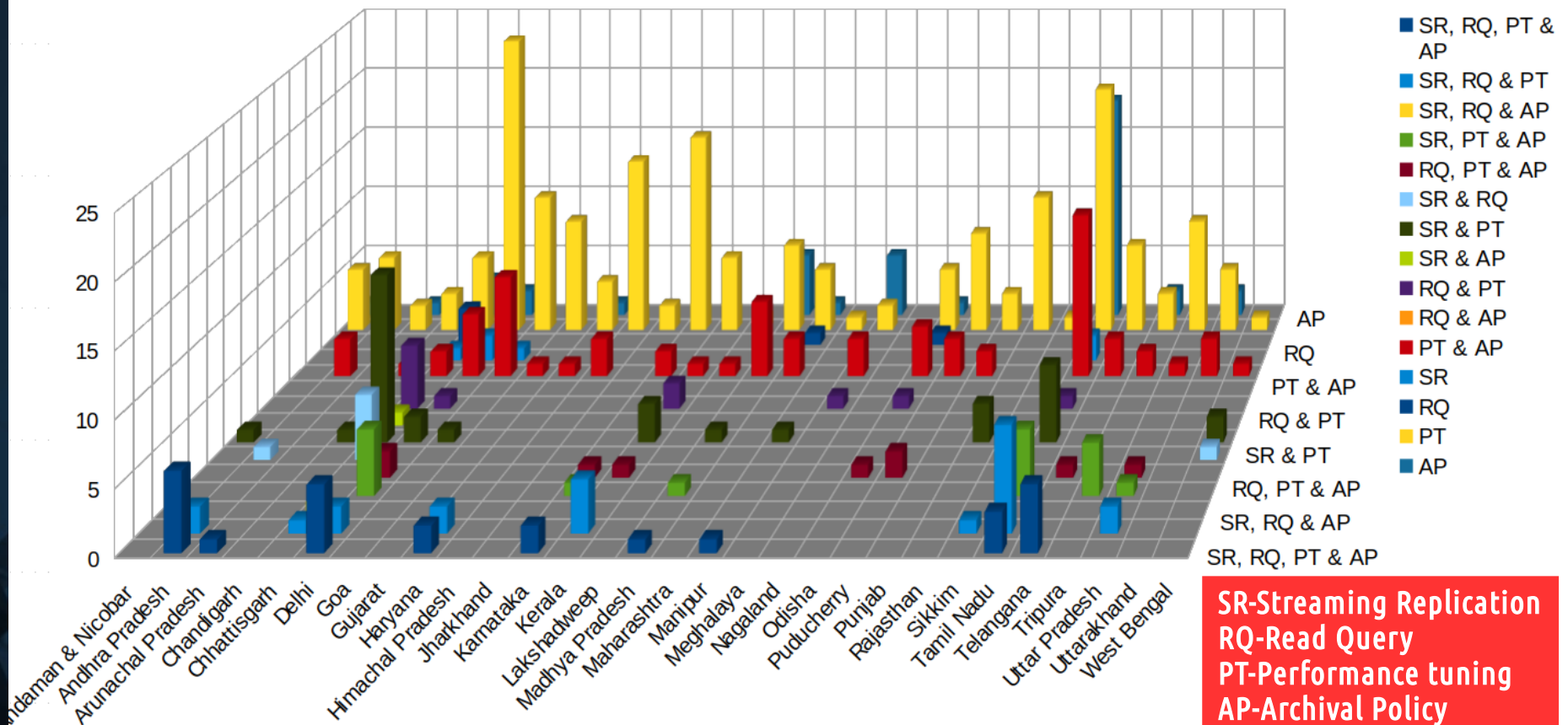


Capacity building on Drupal and Wordpress CMS to be enabled through Online, Workshops and Class Room sessions.

# Open Source Software Repository

Evaluate and Recommend ~ OSS Survey 2017-18

## State-wise DB Analysis



Critical project should have the compliance of all 4 in order to keep performance and storage to optimum level and to ensure availability.

**SR-Streaming Replication**  
**RQ-Read Query**  
**PT-Performance tuning**  
**AP-Archival Policy**

OSS National Survey Results (Dec 2017 – Mar 2018)



# Open Source Software Repository

Evaluate and Recommend ~ Tool evaluation

NATIONAL INFORMATICS CENTRE				
NIC, A-Wing, Rajaji Bhawan, Besant Nagar, Chennai - 600 090				
Summary Information				
Sl. No	Criteria	Applicability (0-No 1-Yes)	Score (in the scale of 0-5)	Observations
1	Roadmap	1	4	Longevity - Latest version & Release Date Longevity - Date of Previous Release (Before Latest Vers) Longevity - First Release & Age of the Product
2	Reputation	1	4	Community - Number of posts and users Community - Quality of reply & Response time Release Activity - Number of releases per year Longevity - Latest version & Release Date Longevity - First Release & Age of the Product Longevity - Repository detail
3	Standards	1	3	Integration - Standards
4	Support (Community)	1	4	Community - Discussion Forum / Mailing List Community - Friendliness Longevity - First Release & Age of the Product Longevity - Total Number of Releases Longevity - Repository detail Does the product has Community edition ? Support - Community Support
5	Support (Commercial)	1	0	Does the product has enterprise edition Support - Paid support Support - Vendor / Third party
6	Documentation	1	4	Documentation - User Documentation available ? Documentation - Developer Documentation available ? Documentation - Maintainer Documentation available ? Documentation - Is it up to date ? Documentation - Books Available ?
7	Maintainability	1	4	Release Activity - Significance - security/feature/major/min Longevity - Latest version & Release Date Longevity - Date of Previous Release (Before Latest Vers) Longevity - First Release & Age of the Product
8	Scalability	1	2.7	Functionality - Feature List Functionality - Limitations DevOps details - Is the product is available as Containe
9	Usability	1	2.7	Functionality - Feature List Functionality - Limitations DevOps details - Is the product is available as Containe
10	Security	1	3.7	Release Activity - Number of releases per year Support - Failure Support (Bug Tracker) Security (how many security vulnerability patches were rele
11	Interoperability	1	3.2	Platform availability Cross Platform Compatibility Integration - Modularity Integration - Collaboration with other products DevOps details - Is the product is available as Containe
12	Skill set	1	3	NIC Resources
13	License	1	3	License Does the product has Community edition ? Does the product has enterprise edition
Total		13	41.3	
Average Score			3.2	
Recommended for OSS Stack Inclusion :			Yes	

## Software Release Cycle of OSS Tools

- Varied Choices
  - LTS Releases
    - Long term committed community Support
  - End of Life Announcements
    - New protocols
    - Non availability of contributors
- Understanding the process followed for each tool is essential for meta-data collection.
  - Key Challenge : No uniform process or coding convention adopted
  - But tools usually have a Release Policy or Version Policy
- Release Policy
  - Version Numbering System
  - Schedule Details
  - LTS Information
  - End of Life Announcements
  - Update and Upgrade Requirements
- Every release has a release notes

# Open Source Software Repository

Open Source Software Stack – Functional domains

- Programming Language Client-side
- Relational Database
- Web / HTTP Server
- Programming Language Server-side and Library
- Server Side Framework
- Application Server
- Client-side Framework
- Server Operating system
- Portal/CMS
- GIS Desktop
  
- Non-Relational Database (Big Data)



# Open Source Software Stack based Apps...

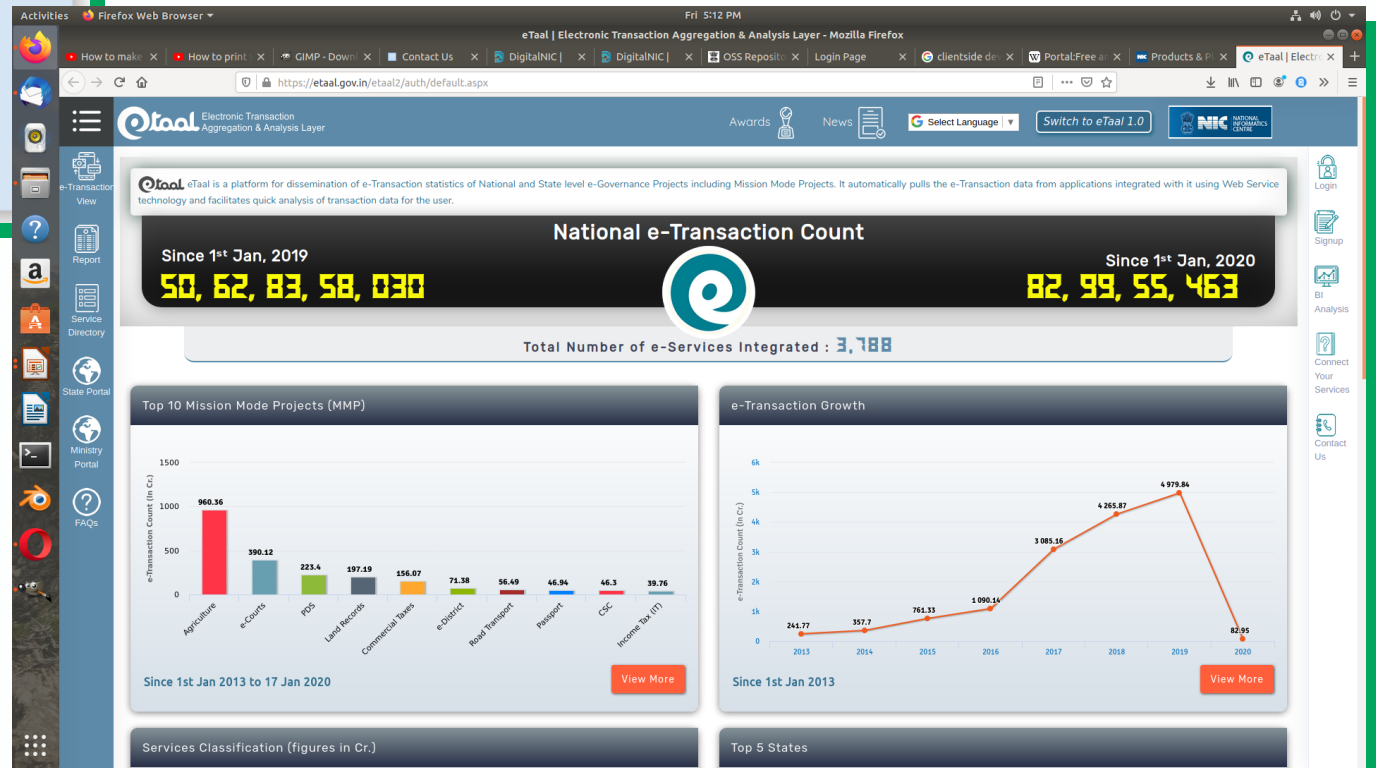
# NIC OSS Products & Services



eTaal

An aggregated view of e-Transactions performed through eGovernance applications

[View more](#)



# NIC OSS Products & Services



## Service Plus

Making all Government services accessible to the common man

[View more](#)

The screenshot displays the ServicePlus website interface. At the top, the logo "ServicePlus" is accompanied by the tagline "Metadata-based Integrated eService Delivery Framework". The navigation bar includes links for HOME, SERVICES, ABOUT US, FEATURES, REQUEST FOR DEMO, SELECT STATE, LANGUAGE, and LOGIN. The main content area features a circular progress chart with "1000+ Services Completed" at its center. The chart is divided into segments for different stakeholder groups: GOVERNMENT, Kiosk Operators, Service Center Operators, Customers, and Suppliers. A timeline on the right shows service completion from 2012 to 2019, with a total of 1000+ services completed by 2019. Below the chart, the "CITIZEN Section" includes links for Register Yourself, Forgot Password, and Track Application Status. The "Newly Launched SERVICES" section lists various services such as Economically Weaker Section (EWS) for allotment of residential flats, application for change of course at KSGH Music and Performing Arts University, and application for issue of No Objection Certificate. The "Find A REPORT Of Interests!" section offers reports like List Of Services Offered Across The Country, State Wise Pendency Report, Summary Report For Application Count, and Beneficiary Profile Wise. The footer contains the text "ServicePlus - Easy and Intuitive Application" and "Developed as part of Panchayat Enterprise Suite (PES) under e-panchayat Mission Mode Project (MMP)".

# NIC OSS Products & Services



## National Scholarships Portal

One-stop solution for scholarship process

[View more](#)

Activities Firefox Web Browser Fri 5:18 PM  
Home - National Scholarship Portal - Mozilla Firefox  
https://scholarships.gov.in

SCHOLARSHIP FELLOWSHIP For Academic Year 2019-20

NATIONAL SCHOLARSHIP PORTAL  
Ministry of Electronics & Information Technology,  
Government of India

New Registration Login Digital India  
GET IT ON Google Play

Home About Us Services Important Documents Institute Login  
Officer's Login

Application form

MOMA RSPF MOLE DOHE UGC MOTA  
MOSJ DEPD

SEARCH FOR INSTITUTE DASHBOARD

Latest Updates

- Ishan Uday Scheme is open for Renewal of Academic Year 2017-18 Applicants.
- Central sector schemes are open for the state of Jammu and Kashmir students till 31st January 2020.

Attention Institutes

Central Schemes

- Ministry of Minority Affairs
- Department of Empowerment of Persons with Disabilities
- Ministry of Social Justice & Empowerment
- Ministry of Labour & Employment
- Ministry of Tribal Affairs
- Department of School Education & Literacy

# NIC OSS Products & Services



## eCourts

Transparent, accessible and cost effective Justice delivery system

[View more](#)

The screenshot displays the eCourts India Services website interface. The top navigation bar includes links for Home, NJDG, Supreme Court, High Courts, District Courts, and Contact Us. The main content area features a carousel with a slide titled "Interoperability and Compatibility" and several statistics cards:

High Court Complexes	HC Pending Cases	HC Disposed Cases	HC Cases Listed Today
39	4.58 M	113.16 K	30.52 K
District & Taluka Court Complexes	DC Pending Cases	DC Disposed Cases in Last Month	DC Cases Listed Today
3205	31.71 M	1.56 M	886.87 K

Below the statistics, there are links for "Policy Action Plan Document of Phase II", "Innovations in Phase II", "Objectives Accomplishments Report-2019", and "Annexure to the Report-2019". At the bottom, there are instructions to download the mobile app for Android & iOS and a section for "NEWS & EVENTS".

# NIC OSS Products & Services



## Open Government Data (OGD) Platform, India

Transparency in Government functioning

View more

The screenshot displays the data.gov.in website interface. At the top, there is a green navigation bar with the data.gov.in logo, a search bar, and links for login and registration. Below this is a large banner for the #OPENGOVDATAHACK2019, featuring a map of India and text: "MULTICITY CODING & HACK CHALLENGE FOR DATA DRIVEN INNOVATION STUDENTS, DEVELOPERS, STARTUPS, ENTREPRENEURS, MSMEs, ETC." The main content area is divided into three columns: 1. ANALYTICS: A list of statistics including 361,784 resources, 8,071 catalogs, 165 departments, 25.95 M times viewed, 7.89 M times downloaded, 350 chief data officers, 25,709 APIs, and 1,923 visualizations. 2. CATALOG: A featured item for "Udyog Aadhaar Memorandum (MSME Registration)". 3. INDICATOR DASHBOARD: A grid of six indicators: Drinking Water And Sanitation, Health, Transport, Labour And Employment, Economy, and Education. A "SECTORS" section is partially visible at the bottom.



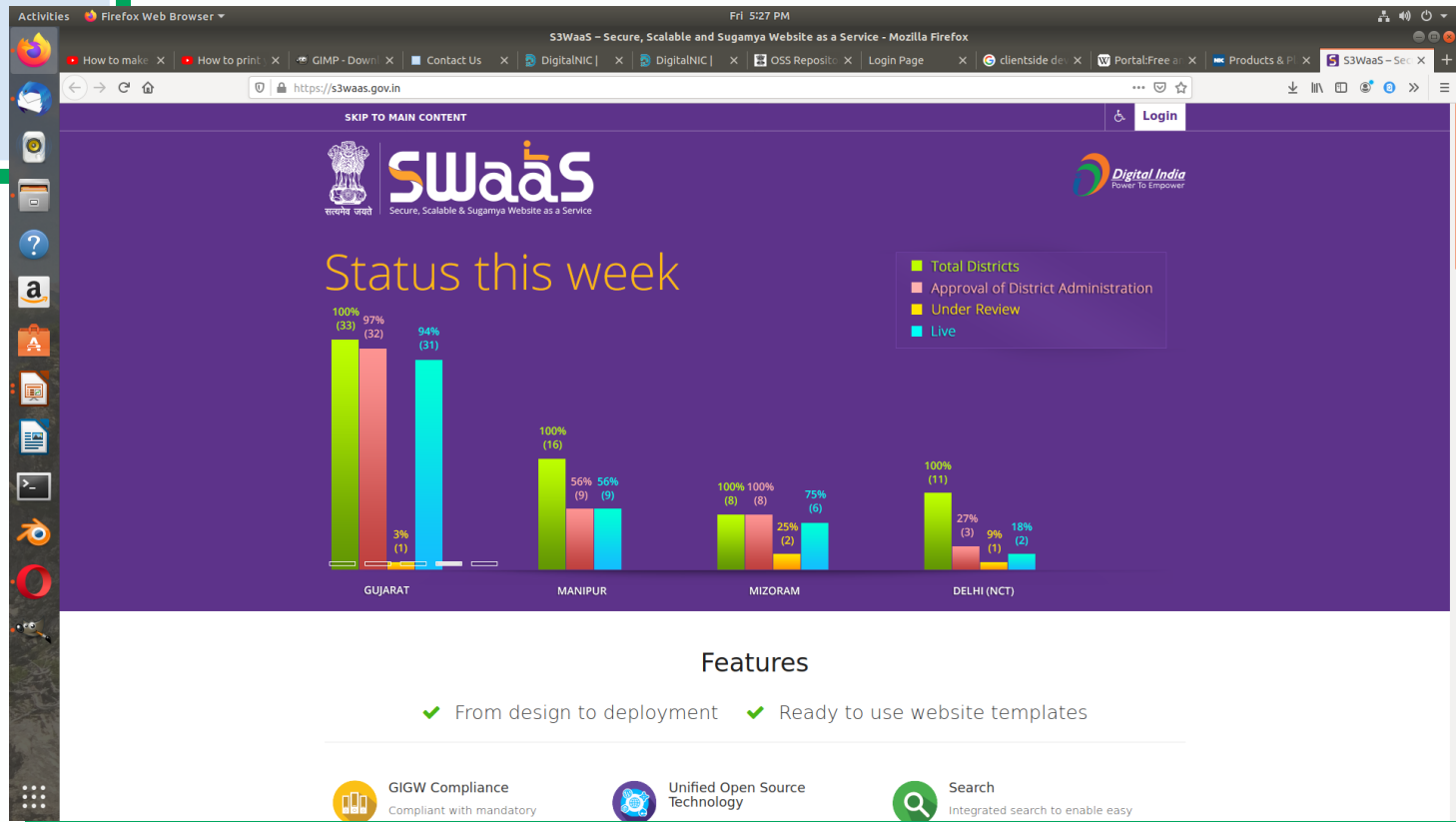
# NIC OSS Products & Services

**S3WaaS**  
Secure, Scalable & Sugamya Website as a Service

**S3WaaS**

Enhanced user-friendly  
functionalities & interfaces of  
govt. Websites

[View more](#)



# NIC OSS Products & Services



## e-Hospital

Simplifying Healthcare Service Delivery


[View more](#)

The screenshot displays the e-Hospital dashboard interface. At the top, it features the logos of the Ministry of Electronics & Information Technology and the Ministry of Health & Family Welfare, Government of India. The dashboard is divided into two main sections: 'E-HOSPITAL DASHBOARD' and 'ORS DASHBOARD'. The 'Patient Registration' section includes two dropdown menus for 'All States' and 'All Hospital'. Below these are four data cards:

Category	Value
HOSPITAL COUNT	345 <sup>+</sup>
SINCE SEPT'15	14,43,57,721 <sup>+</sup>
CURRENT MONTH	28,12,910 <sup>+</sup>
YESTERDAY	1,85,470 <sup>+</sup>

Each card has a 'MORE...' link. Below the data cards is a 'Day wise Patient Registration' section with a dropdown for '29 DAYS' and a line graph showing patient registration trends over time.

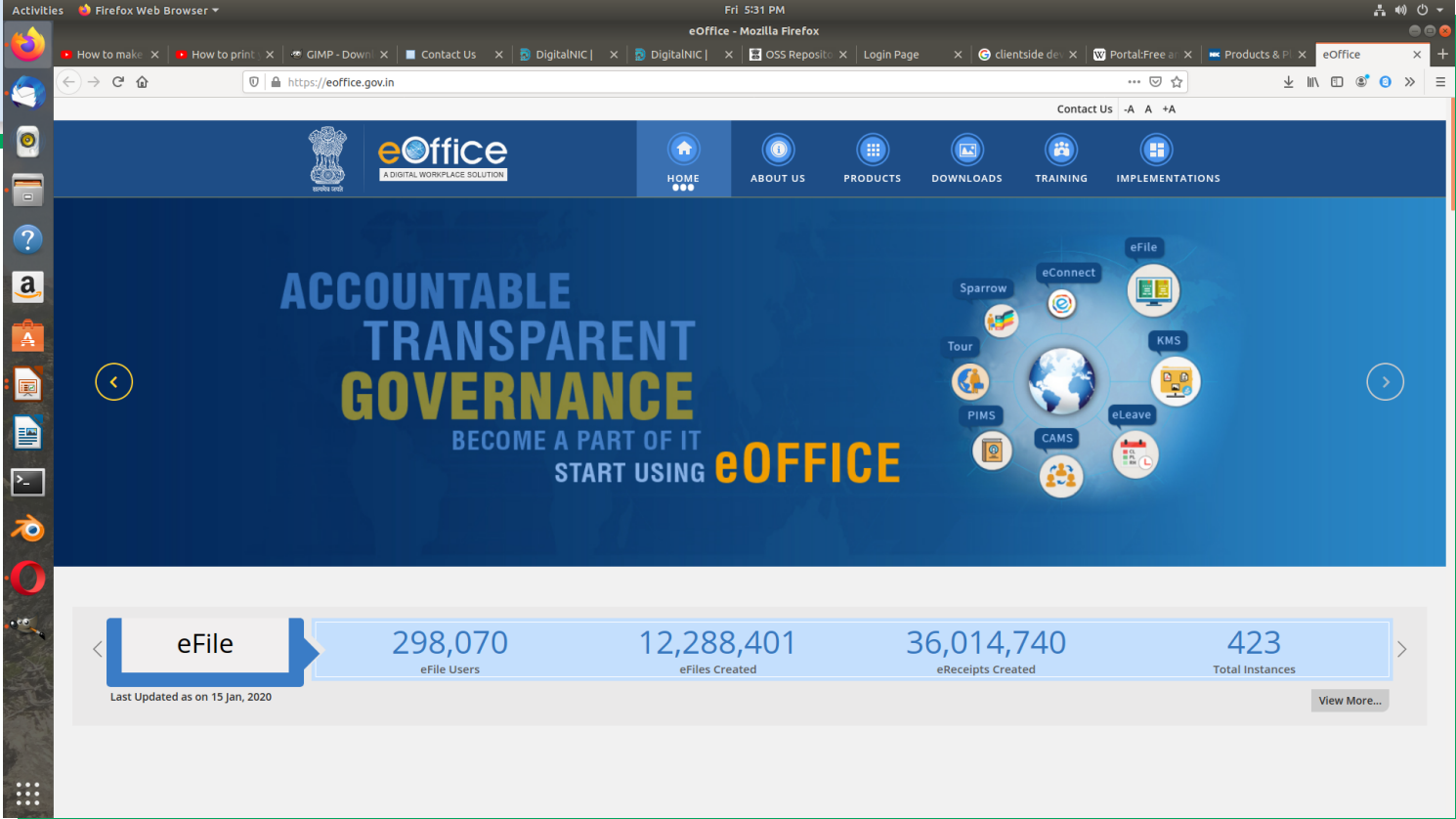
# NIC OSS Products & Services



**e-Office**

A Digital Workplace Solution for all government employees

[View more](#)



ACCOUNTABLE  
TRANSPARENT  
GOVERNANCE

BECOME A PART OF IT  
START USING **eOFFICE**

Service	Users	Files Created	Receipts Created	Total Instances
eFile	298,070	12,288,401	36,014,740	423

Last Updated as on 15 Jan, 2020

# NIC OSS Products & Services



## Government e-Procurement System

Simplifying government procurement/tendering system

[View more](#)

Central Public Procurement Portal

Search by Organisation Name

Home | About | OMs/GOs/Others | Search a Tender | Dashboard | Related Links | Debarment/Grievances | Help | Contact Us | Sitemap | Select Portal

Central Public Procurement Portal

Goods Service Works

eProcurement System Government of India

Active Tenders	Tenders Opening Today	Tenders Closing Today	No. of Organisations
38971	3986	3271	729

Statistics

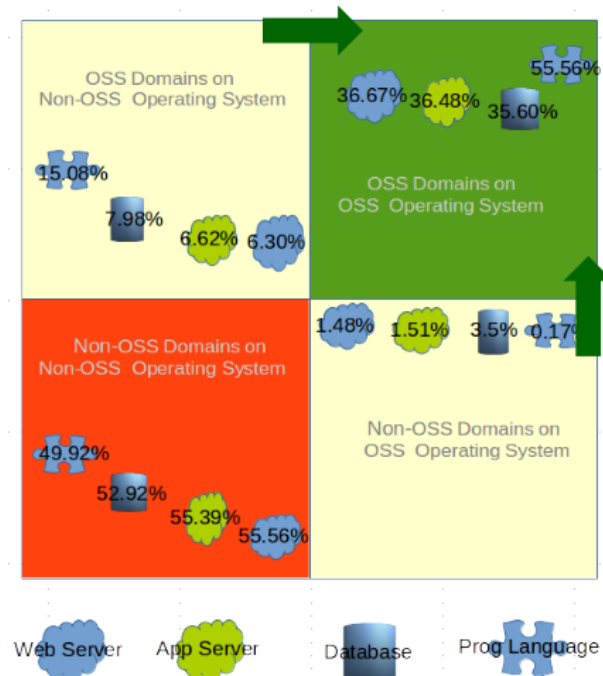
eTenders-Top 10 Organisations for Current Fin. Year

eNewsletter  
Annual Report 2017-18  
Bid / RA Notices GeM

# Change over to Open Source

## Domain distribution on Server Operating Systems

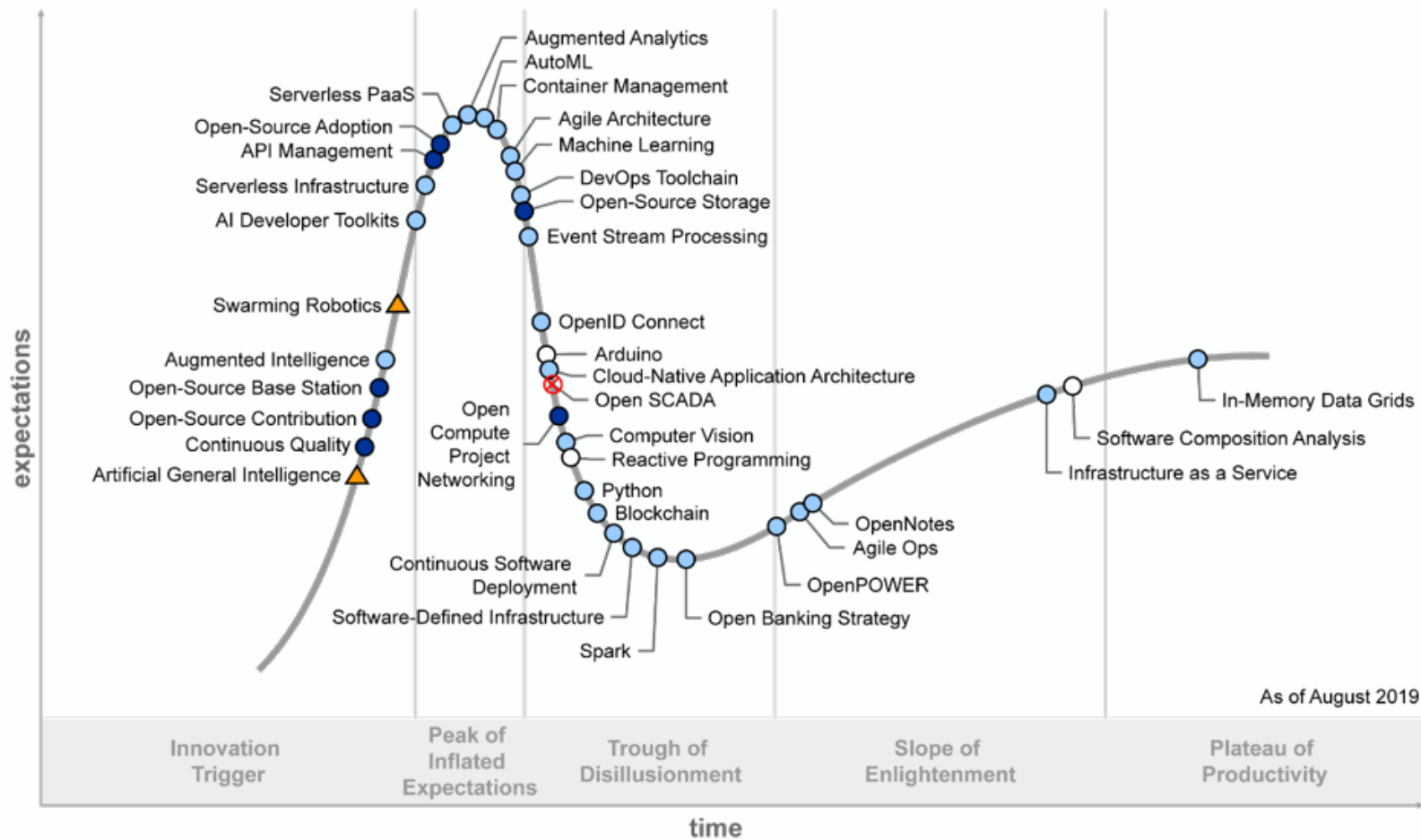
	Non-OSS Operating System	OSS Operating System	
Web Server	34	198	OSS Domains
App Server	35	193	
Database	41	183	
Prog.Language	90	208	
Web Server	300	8	Non-OSS Domains
App Server	293	8	
Database	272	18	
Prog.Language	298	1	



The Non-OSS Server Operating Systems need to plan for migration to the Open Source Operating System as per OSS Policy. Necessary Capacity building programmes to be planned.

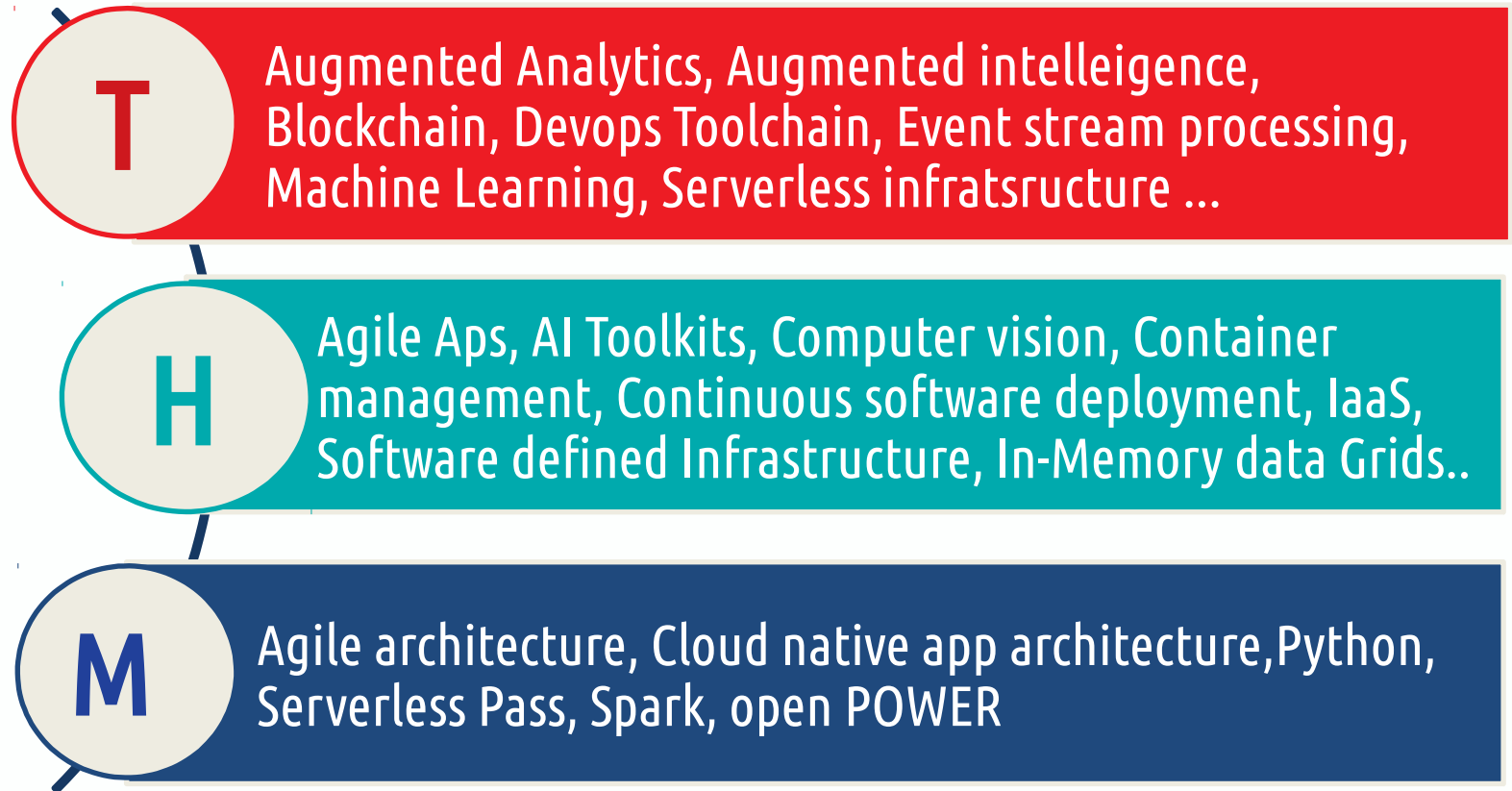
OSS National Survey Results (Dec 2017 – Mar 2018)

# Hype Cycle for Open-Source Software, 2019



Source: Gartner  
ID: 376726

# Open Source Software future adoption



**T**  
Transformational

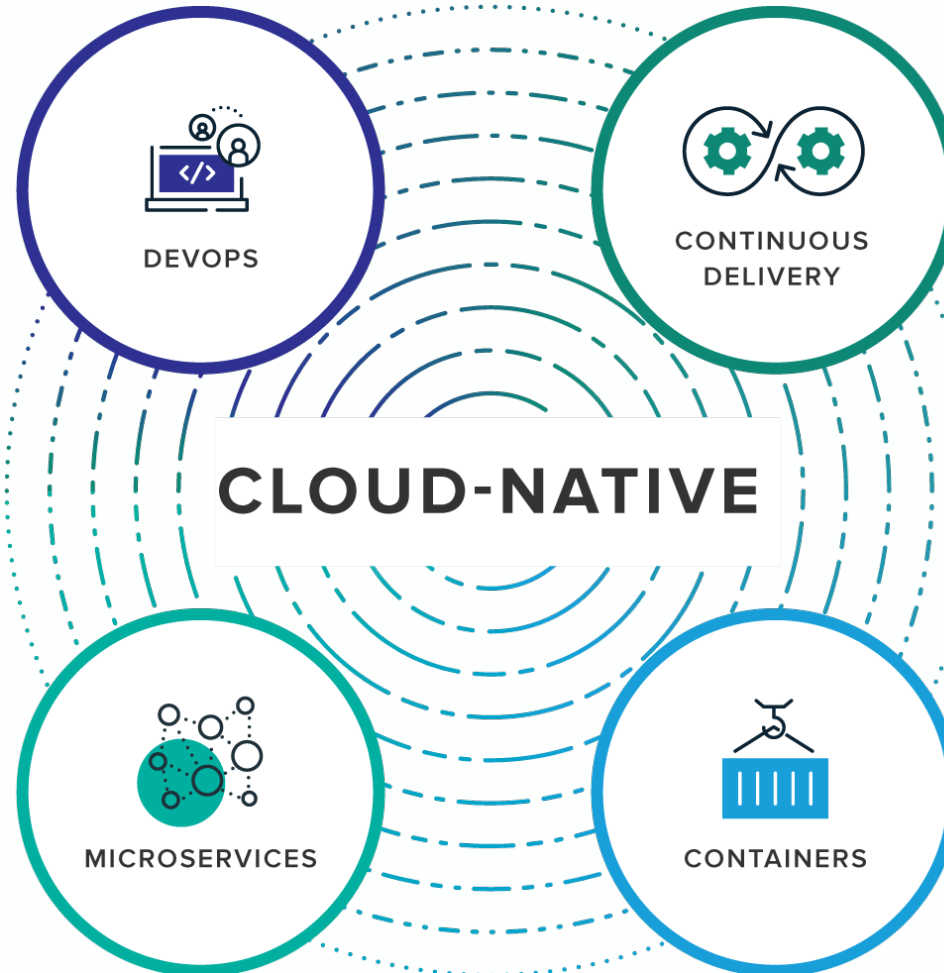
**H**  
High

**M**  
Moderate

Data: Gartner 2019

# Open Source Software future adoption

DevOps is the collaboration of constantly delivering high-quality software that solves customer challenges with people, process and tools



shipping small batches of software to production constantly, through automation

single OS instance is dynamically divided among one or more isolated containers, each with a unique writable file

Microservices is an architectural approach to developing an application as a collection of small services. Each microservice can be deployed, upgraded, scaled, and restarted



# Open Source Software future adoption

Traditional Enterprise Apps	Cloud Native Apps using openstack and OSS tools
Unpredictable	Predictable (highly automated container driven)
OS dependent	OS abstraction (team focus on software)
Over-sized capacity	Right-sized capacity (infrastructure provisioning)
Siloed	Collaborative (Devops)
Waterfall (time consuming SDLC)	Continuous delivery (agile, continuous)
Dependent (single deploy with dependencies)	Independent (small loosely coupled Microservices)
Manual scaling (Manual server, network, storage mgt)	Automated scaling (automated)
Slow recovery (VM based)	Rapid recovery (Container Based)

Thank You