

Grid-based Authentication Solution

Product Brief

CyGrID, a Grid-based authentication solution, offers seamless, secured authentication with unmatched user convenience and easy implementation for any organization. Without requiring any software installation or hardware provisioning, CyGrID can provide a strong two-factor authentication for any password based system.

Part of CyLock MFA platform, CyGrID provides a secured and cost effective two-factor authentication mechanism to generate OTPs without the need of a hardware token or smart phone. For enhanced security, CyGrID can be combined with other authentication mechanisms like out-of-band (OOB) push authentication, QR authentication—all conveniently managed through a unified portal.

Technical Specifications:

- Integration through REST APIs
- Available in both SaaS and on-premise deployments
- Supports any standard browser across devices
- Authenticate first factors against Active Directory, OpenLDAP and FreeIPA
- For Windows Logon – Credential Provider for Windows 10 and 11 OS

		X – Digit Value									
		4	0	7	3	6	9	5	8	1	2
GRID PIN	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	4 th	9	2	6
	0	6	9	2	5	2	1	3 rd	5	9	6
	9	1	6	1	2	9	9	5	6	5	2
	6	2	1	6	1	6	9	1 st	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	2 nd	6	2	1
8	5	6	1	1	9	2	6	9	5	1	

Benefits

- Easy to implement
- Frictionless authentication as no devices are involved
- REST APIs allow seamless integrations with any web application
- Enforce strong and effective GRID PIN policies
- Increase in user adoption, as there are no additional devices or tokens to manage
- Protect access to any web application - On-premise or cloud hosted.
- Defend against cyber-attacks
- Reduced administrative overhead

Using CyGrID during Authentication

To enable CyGrID as second factor authentication, every end user has to set a GRID PIN and X-Digit value prior to using it for authentication purposes. During authentication CyGrID presents a 10 X 10 grid containing random digits. End user has to derive the OTP based on the GRID PIN and X-Digit value set by them earlier. If the derived OTP is correct the user will be allowed access or else denied access. The 10 X 10 grid will contain different set of numbers for each user and for every authentication thus making it very safe and secure. Without the users GRID PIN and X-Digit value it will be difficult to derive the OTP for authentication. The generated OTP is time bound and will expire if not presented within a time period which is configurable in our platform.

CyGrID OTP Generation

Method 1

Step 1

The OTP is formed at the GRID crossroads of PIN and X-Digit.

		X - Digit Value									
		4	0	7	3	6	9	5	8	1	2
GRID PIN	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	4 th	9	2	6
	0	6	9	2	5	2	1	3 rd	5	9	6
	9	1	6	1	2	9	9	5	6	5	2
	6	2	1	6	1	6	9	1 st	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	2 nd	6	2	1
	8	5	6	1	1	9	2	6	9	5	1

- R C
- (6,5) = 2
 - (7,5) = 9
 - (0,5) = 1
 - (3,5) = 1

The GRID OTP = **2911**

Step 2

To derive the OTP, simply choose the corresponding value as follows:
Example: PIN: 6703, X-Digit Value: 5

		X - Digit Value (5)									
		4	0	7	3	6	9	5	8	1	2
GRID PIN (6703)	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	1	9	2	6
	0	6	9	2	5	2	1	3 rd	5	9	6
	9	1	6	1	2	9	9	5	6	5	2
	6	2	1	6	1	6	9	2	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	9	6	2	1
	8	5	6	1	1	9	2	6	9	5	1

THE GRID OTP

2911

Method 2

Step 1

CyGrid enhances OTP security by allowing users to combine their GRID PIN with the two-digit X value, deriving each OTP digit by pairing corresponding digits sequentially.

		X - Digit Value									
		4	0	7	3	6	9	5	8	1	2
GRID PIN	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	1	9	2	6
	0	6	9	2	5	2	1	1	5	9	6
	9	1	6	1	2	9	5	6	5	2	
	6	2	1	6	1	6	9	2	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	1	2	2	1	5	
	7	2	5	9	6	5	9	6	2	1	
8	6	1	1	9	2	6	9	5	1		

$$\begin{aligned} R \ C \\ (8,4) &= 5 \\ (5,6) &= 5 \\ (7,4) &= 1 \\ (9,6) &= 9 \end{aligned}$$

The GRID OTP = **5519**

Step 2

OTP is derived as follows:

Example: PIN: 8579, X-Digit Value: 46

		X - Digit Value (46)									
		4	0	7	3	6	9	5	8	1	2
GRID PIN (8579)	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	1	9	2	6
	0	6	9	2	5	2	1	1	5	9	6
	9	1	6	1	2	9	5	6	5	2	
	6	2	1	6	1	6	9	2	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	9	6	2	1
8	5	6	1	1	9	2	6	9	5	1	

THE GRID OTP **5519**

Method 3

Step 1

Generate the OTP by pairing digits from the GRID PIN and its reverse in sequential positions

		Reverse Pin									
		4	0	7	3	6	9	5	8	1	2
GRID PIN	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	1	9	2	6
	0	6	9	2	5	2	1	1	5	9	6
	9	1	6	1	2	9	9	5	2		
	6	2	1	6	1	6	9	2	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	9	6	2	1
8	5	6	1	1	9	2	6	9	5	1	

$$\begin{aligned} R \ C \\ (8,9) &= 2 \\ (5,7) &= 6 \\ (7,5) &= 9 \\ (9,8) &= 6 \end{aligned}$$

The GRID OTP = **2696**

Step 2

OTP is derived as follows:

Example: PIN: 8579, Reverse Pin: 9758

		Reverse Pin(9758)									
		4	0	7	3	6	9	5	8	1	2
GRID PIN (8579)	4	2	5	2	6	1	5	9	1	6	9
	3	5	2	5	9	1	6	1	9	2	6
	0	6	9	2	5	2	1	1	5	9	6
	9	1	6	1	2	9	9	5	2		
	6	2	1	6	1	6	9	2	5	9	5
	1	9	5	9	5	2	2	6	1	6	1
	2	6	1	9	2	5	6	5	2	1	9
	5	9	9	6	6	5	1	2	2	1	5
	7	1	2	5	9	6	5	9	6	2	1
8	5	6	1	1	9	2	6	9	5	1	

THE GRID OTP **2696**

CyGrID is as simple as remembering a PIN and computing a secured OTP very easily without any complications. With no client side installations, this UI driven authentication method is compatible with desktops, laptops, tablets, and smartphones equipped with any standard web browser.

During every login, a user is required to derive an OTP for the new challenge displayed on screen, thus enhancing the security of any password based systems. Combined with GRID rule settings, PIN data dictionary, CyGrID effectively counters brute force attacks thereby preventing data breaches, account takeover, and any unauthorized access to corporate network.

CyGrID exposes APIs which can be seamlessly integrated into any browser based web applications to enable strong two factor authentication.

Use Cases

- Any Web Application
- Windows Logon
- Remote Access through RDP
- Browser based SSL VPN login
- Single Sign-On



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